





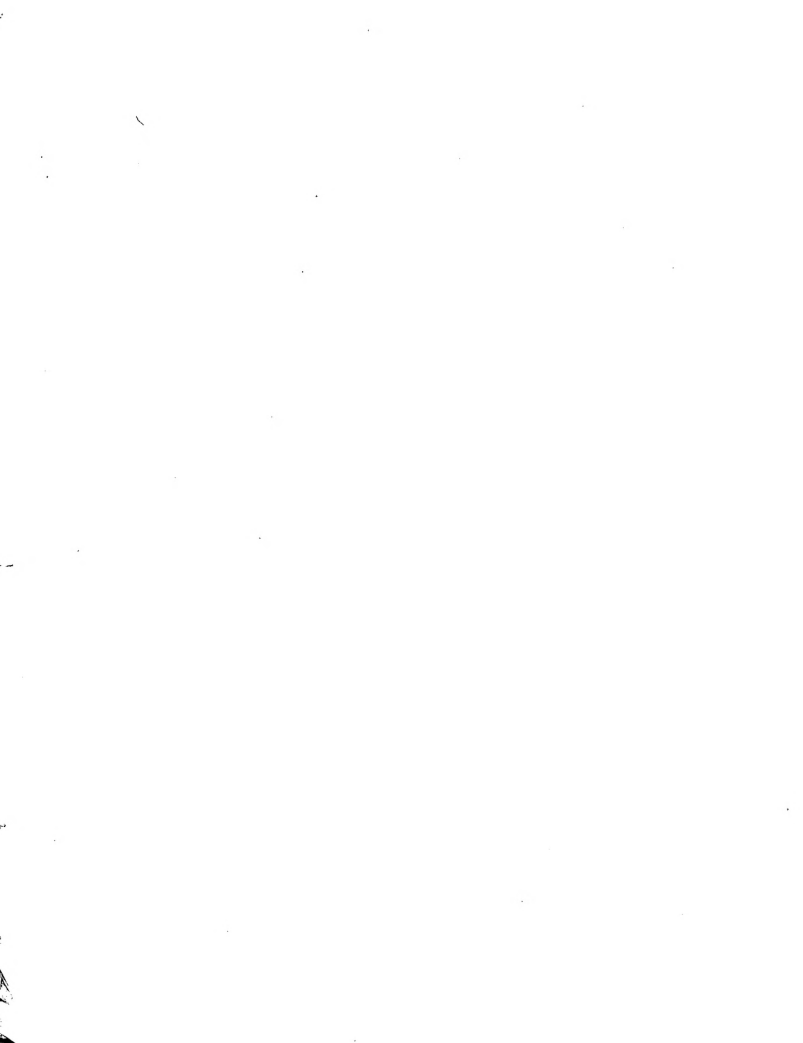
Employment and Earnings of  
Married Females

by

Alice Nakamura, Masao Nakamura  
and Dallas Cullen

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University of Alberta



# Employment and Earnings of Married Females

By Alice Nakamura, Masao Nakamura  
and Dallas Cullen  
in collaboration with  
Dwight Grant and Harriet Orcutt

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## FOREWORD

The Canadian censuses constitute a rich source of information about the condition of groups and communities of Canadians, extending over many years. It has proved to be worthwhile in Canada, as in some other countries, to supplement census statistical reports with analytical monographs on a number of selected topics. The 1931 Census was the basis of several valuable monographs but, for various reasons, it was impossible to follow this precedent with a similar program until 1961. The 1961 Census monographs received good public reception, and have been cited repeatedly in numerous documents that deal with policy problems in diverse fields such as manpower, urbanization, income, the status of women, and marketing. They were also of vital importance in the evaluation and improvement of the quality and relevance of Statistics Canada social and economic data. This successful experience led to the decision to expand the program of census analytical studies by entering into an agreement with the Social Science Federation of Canada. The present series of analyses is focused largely on the results of the 1971 Census.

The purpose of these studies is to provide a broad analysis of social and economic phenomena in Canada. Although the studies concentrate on the results of the 1971 Census, they are supplemented by data from several other sources. These reports are written in such a way that their main conclusions and supporting discussion can be understood by a general audience of concerned citizens and officials, who often lack the resources needed to interpret and digest the rows of numbers that appear in census statistical bulletins. For these persons, interpretive texts that bring the dry statistics to life are a vital dimension of the dissemination of data from a census. Such texts are often the only means that concerned citizens and officials have to personally perceive benefits from the national investment in the census. This particular report is one of a series planned to be published concerning a variety of aspects of Canadian life, including income, language use, farming, family composition, migration, adjustment of immigrants, human fertility, labour force participation, housing, commuting and population distribution.

I should like to express my appreciation to the universities that have made it possible for members of their staff to contribute to this program, to authors within Statistics Canada who have freely put forth extra effort outside office hours in preparing their studies, and to a number of other members of Statistics Canada staff who have given assistance. An Advisory Panel of the Social Science Federation of Canada organized and conducted an author selection process for several studies, and arranged for review of seven manuscripts in their original version. In addition, thanks are extended to the various readers, experts in their fields, whose comments were of considerable assistance to the authors.

Although the monographs have been prepared at the request of and published by Statistics Canada, responsibility for the analyses and conclusions is that of the individual authors.

PETER G. KIRKHAM,

Chief Statistician of Canada.

## PREFACE

This monograph is devoted to an analysis of the labour force behaviour of Canadian wives, since married women are the most controversial and rapidly changing component of the female labour force. We examine characteristics of wives and their families. We study the communities in which they live, since area of residence appears to be related to whether or not a wife is in the labour force, and to the determination of the annual hours of work, as well as hourly wage rates of those who do work. We also try to briefly assess some of the effects of the labour force behavior of married women on children, the family income distribution in Canada, and the ownership of houses and other durable goods.

We are grateful to Bruce Wilkinson and R. Marvin McInnis for their help and encouragement in the early formative stages of this project, and to Leroy O. Stone and R.A. Wallace who monitored the progress of our work over a period of more than two years. Our intellectual debt to James Heckman is obvious; we benefited from both his published work and from unpublished material which he shared with us at the time when we were beginning this project. Arthur Ridgeway provided helpful research assistance.

This monograph has evolved through several drafts which were patiently and carefully typed by Valerie De Prato, Audrey Milligan, and Marjorie Whitford.

Finally we were fortunate in having our monograph read by two anonymous referees who clearly are experts in the nuances of using Census data. Owing to their efforts, the number of remaining errors in this monograph, for which we must accept full responsibility, is smaller than would otherwise have been the case.

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Masao Nakamura,  
Dallas Cullen,  
University of Alberta,  
February 1979.



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## CHAPTER 1

### INTRODUCTION AND OVERVIEW

One of the most striking characteristics of the Canadian labour force during the period 1951-71 has been the rapid growth in the number of women in the labour force. In 1951, women were 22.0% of the labour force; by 1971 they were 34.3%. The total number of persons in the labour force grew by 62.8% in that period; the number of women in the labour force grew by 153.8%. Even more striking is the increased labour force participation of married women. In 1951, married women were 29.9% of the female labour force; by 1971, they were 59.1% of the female labour force. Finally, whereas the number of non-married (single, widowed, divorced) women in the labour force grew by 45.1% in the period 1951-61, the comparable figure for married women is 407.8%.<sup>1</sup>

On the one hand, there are those who see the increased participation of women in the labour force, and particularly of married women, as a form of liberation. Just as women in historical times won the right to own property and the right to vote, now women are winning the right to earn incomes that will bring full meaning to the liberties previously won. These supporters also note the potentially expansionary effect on the Canadian economy of the influx of large numbers of women into the labour force. On the other hand, there are those who view this same development as a threat to the stability of marriages, the well-being of children and the wage rates and job security of married men. The causes of this dramatic change are of interest to both those who favour and those who fear its implications.

This monograph is devoted to an analysis of the labour force behaviour of Canadian wives, since married women are the most controversial and rapidly changing component of the female labour force.<sup>2</sup>

In Chapter 2 we concentrate on how many, and which, wives work,<sup>3</sup> while Chapter 3 is concerned with the female unemployment problem. The purpose of working, for most wives, is to earn income. A wife's employment income is determined by her hours of work and her hourly wage rate. Thus, in Chapter 4 we

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See footnote(s) on page 21.

examine the determinants of the hours of work and wage rates of wives who work. Finally, in Chapter 5 we try briefly to assess some of the effects of this massive movement of married women into the labour force. In particular, we look at the child status of wives who earned employment income in 1970. We look at the impact of the employment income earned by wives in 1970 on the inequality of the Canadian family income distribution. We also summarize related findings concerning the impact of the earnings of wives on various aspects of a family's choice of housing, and the ownership of vacation homes and a variety of durable goods.

Chapters 2 through 4 share a common theoretical underpinning. We have attempted to analyse the labour force behaviour of Canadian wives in terms of factors affecting what we will call their "asking" and "offered" wage rates. The asking wage is defined as the wage a woman must receive to be willing to work, and the offered wage is defined as the wage she could receive if she did work. In other words, the asking wage represents the opportunity cost of working from the point of view of the wife and her family, while the offered wage represents what employers are willing to pay a given wife to work.

Our behavioural hypothesis is that a wife will work if her offered wage is higher than her asking wage at zero hours of work. We argue that the asking wage of a working wife will increase as she increases her hours of work. That is, a working wife's asking wage at her actual hours of work will always exceed her asking wage at zero hours of work. Moreover, our hypothesis is that a working wife will continue to increase her hours of work, and hence her asking wage, until her asking wage at her actual hours of work equals her offered wage.

We further argue that a wife's asking wage at zero hours of work is independent of her offered wage, because at zero hours of work a change in her offered wage rate will not affect her level of earnings. (Nor would it affect her earnings very much at, say, one hour of work.) In the terminology of economists, we are arguing that the income effects at zero hours of work (or in moving from zero to one hour of work) are negligible. On the other hand, the earnings of wives who do work are affected by changes in their offered wage rates. In particular, the higher the offered wage rate, the fewer hours a wife must work to earn any given level of income. Thus, for wives who work, we argue that their asking wage rates will be higher the higher their offered wage rates are, all other factors remaining unchanged.

Thus, our hypothesis is that factors that increase a wife's asking wage will decrease her probability of working, and decrease her expected hours of work if she does work. Factors that increase a wife's offered wage will increase her probability of working, but may increase or decrease her expected hours of work if she does work, depending on the extent to which increases in her offered wage also serve to increase her asking wage.

Variables found to be positively related to a wife's asking wage are the number of children less than six years of age, the number of children 6-14 years of age, the number of children ever born, the employment income of the husband, the asset income of the family and a dummy variable set equal to one if the husband has stated that the major language of the home is French. Variables found to be negatively related to a wife's asking wage are the number of children 19-24 years of age attending school, the product of the number of children less than six years of age times the number 6-14 years of age and the employment income of the husband plus the asset income of the family divided by the number of persons in the family. Likewise, variables found to be positively related to a wife's offered wage are the wife's years of education, the age of the wife at first marriage and a "local opportunity for jobs" index; the number of children less than six years of age is found to be negatively related to this offered wage. Our evidence concerning the impact of the provincial unemployment rate on the offered wage is mixed.

The effects we have found to be most important may be summarized as follows. A wife's asking wage will be higher the more children she has and the wealthier her family is. Her offered wage will be higher the more educated she is and the more job opportunities there are on a per woman basis in the locality where she lives.

All of the explanatory variables listed above have been included in previous studies of the labour force behaviour of women, with the exception of our local opportunity for jobs index. The inclusion of this variable is predicated on the notion that employment opportunities are largely sex-typed. However, we do not delve into the origins of this sex-typing in this monograph; that is, we have made no attempt to determine how much of this sex-typing is due to sex-linked attributes that make the members of one sex more suitable for some jobs, how much is due to patterns of family behaviour, and how much is due to psychological factors and historical accidents.

However, in Section 2.2, of Chapter 2, we do provide considerable historical documentation on the existence of industrial and occupational segregation by sex. In providing this material, we are also attempting to provide evidence to support our hypothesis that the sex-typing of jobs, and the industrial and occupational nature of economic growth in Canada since 1951, have had important effects on the labour force behaviour of Canadian wives. It is particularly important to our analysis to establish that it is the industrial and occupational stratification of the Canadian economy by sex that has been affecting the labour force behaviour of Canadian women, including wives, rather than the reverse.

Industries identified in Section 2.2 as female-oriented are the Finance, Community-Personal Service, and Trade industries. Occupations that traditionally have been female-oriented are Teaching, Medicine and Health, Clerical, and Service occupations. On the other hand, there have been, and still are, very few women in the Forestry, Fishing and Trapping, Mining, and Transportation industries. The same is true for the Natural Science and Engineering, Other Primary, Construction, and Transport occupations. Economic growth and other changes affecting the female-oriented industries and occupations will usually have a greater impact on labour market conditions and behaviour of women than similar changes affecting industries and occupations with small proportions of women. We have also shown that the industrial and occupational distribution for married women is essentially the same as for all women, supporting our contention that the factors affecting the labour market conditions for all women will generally have a similar impact on the labour market conditions for married women.

In Sections 2.4 and 2.5 multivariate estimation results are presented to support our behavioural hypothesis that wives work if their offered wage is higher than their asking wage at zero hours of work. In other words, a wife is more likely to work the lower her asking wage and the higher her offered wage. Historical tables in Sections 2.2 and 2.3 of Chapter 2 show that, since 1951, the educational level of women and the job opportunities open to women have both increased, while there has been a sharp decrease on a per family basis in the number of children younger than six. The effect of these changes over time should have been to increase the offered wage rates and decrease the asking wage rates of wives, resulting in the observed increase since 1951 in the percentage of wives working.

Section 3.2 of Chapter 3 documents the transition from a world in which the unemployment rates for women were lower than the unemployment rates for the labour force as a whole in almost every industry and occupation, to the 1971 situation of higher unemployment rates for women compared to the rates for the labour force as a whole in almost every industry and occupation. Evidence is presented to suggest that this transition may be due, at least in part, to increases in the percentages of women working less than 35 hours per week or less than 40 weeks per year.

The main findings in Section 3.3 are that the responses and characteristics that lead some wives who are not working to be unemployed, as opposed to not in the market labour force,<sup>4</sup> and that result in some wives who are in the market labour force working while others are unemployed, are essentially the same responses and characteristics that we have found distinguish wives who work from all those who do not. Thus, social and economic changes that increase the offered wage rates of wives and decrease their asking wage rates may lead, not only to increases in the proportion of wives working, but also to increases in the female unemployment rate.

It should also be noted that in Section 3.2 we find that female unemployment rates in 1971 would probably have been higher, rather than lower, if women had been industrially and occupationally distributed according to the 1971 distributions for the labour force as a whole. We also find that, whereas improved job opportunities for women may lead to increases in the female unemployment rate, nevertheless the 1970 average employment incomes of the husbands of unemployed wives were lower than the averages for the husbands both of wives who were not in the market labour force and of those who were working. Moreover, the average family asset incomes for wives at least 35 years of age, and the average per person family incomes (excluding the earnings of the wife) for wives at least 30 years of age were also lowest for unemployed wives. Thus we find that, whatever the personal motivations of these wives for seeking work, there is an obvious need in their families for additional income.

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See footnote(s) on page 21.

In Chapter 4 we present evidence showing that, although the average income for women was approximately 63% of the average income for all wage earners<sup>5</sup> in 1971, much of this discrepancy can be explained by the overrepresentation of part-time workers in the female labour force, particularly in terms of hours worked per week. We show, however, that even after controlling for the number of hours worked per year, working wives younger than 60 years of age earn less per hour on average than their working spouses. We conclude Chapter 4 by showing that, for working wives, factors that increase their asking wages tend to decrease their hours of work; this is also the net effect of increases in the offered wage. In other words, we find that on average wives work fewer hours if either their costs of working are relatively high (for instance, if they have many children), or if they can earn a great deal for each hour worked.

The primary data source for this monograph is the 1971 Canadian Census, with data from the 1951 and 1961 Censuses also being used for historical comparisons. Several of our tables use summary census data published by Statistics Canada and readily available in libraries. Our multivariate analyses, however, are based entirely on Public Use Sample data.<sup>6</sup>

The provision of Public Use Sample data from the 1971 Census is a bold innovation by Statistics Canada which makes it possible, for the first time, for researchers outside Statistics Canada to use Canadian census data to analyse the interactions of large numbers of variables at the level of the individual, the family and the household. For each of the three basic files that make up the Public Use Sample - Individual, Family and Household - an independent one in one hundred stratified sample was taken from the 1971 Census Master File, thereby preventing any link between data from one file and that from another, which might make it possible to identify a unique record. The Family File was used most extensively in the analyses reported in this monograph, since it allows us to relate the labour force behaviour of individual wives to the characteristics of these wives themselves, their families and the places in which they live.

A multivariate approach has been used wherever possible, since it allows us to estimate the independent impact of each of the explanatory variables after controlling for the effects of all the other explanatory variables. The sign of

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See footnote(s) on page 21.

the coefficient associated with a particular explanatory variable indicates whether the net relationship between that variable and the dependent variable - that is, the variable we are trying to explain - is positive or negative; and the magnitude of the coefficient indicates the expected magnitude of the change in the dependent variable given a one-unit change in the relevant explanatory variable, after controlling for the effects of all other explanatory variables.

In the tables, the numbers in parentheses under the coefficient values are t-statistics (or asymptotic t-statistics in the case of our probit<sup>7</sup> tables). Critical values for these t-statistics are given at the bottom of each table of estimated coefficients. If a t-statistic is greater than, say, the 95% critical point it means that there is a probability of 5% or less that the true value of the associated coefficient is zero. Evidence that the true value of a coefficient is zero is equivalent to evidence that changes in the value of the associated explanatory variable have no relationship to changes in the value of the dependent variable beyond what we would expect by chance.

One further statistic of general interest in our tables of estimated coefficients is the  $R^2$  (or "pseudo  $R^2$  for the model" in the case of our probit tables). The  $R^2$  shows the percentage of the total variation in the dependent variable that is accounted for by an estimated relationship. Thus an  $R^2$  of 0.5103 means that 51.03% of the variation in the dependent variable has been accounted for. Most of the  $R^2$ s reported in this monograph are in a range of approximately 0.03 to 0.30; that is, most of our estimated relationships account for only 3% to 30% of the variation in the dependent variable.

Low  $R^2$ s are common in cross-sectional work using large micro data bases. Unfortunately, the systematic component of individual behaviour attributable to measurable factors is often small. It is still important, however, for us to identify what these factors and their effects are. Moreover, the remaining "unexplained" variability in individual behaviour is really random, or close to random, our estimated relationships will explain very high proportions of the variability in the average behaviour of groups of individuals (stratified by the variables included in these relationships). This question is taken up in greater detail in Section 4.5.

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See footnote(s) on page 21.

The remaining statistics reported in our tables will be of interest to those with specialized training in statistical methods, but are not essential for gaining an understanding of our basic results.<sup>8</sup>

Finally, our use of terminology in this monograph deserves some comment. Most of the references throughout this monograph to wives who work or working wives refer to wives who work for pay or profit. Thus we are including the self-employed, but excluding those who help without pay in a family business or farm (see footnote 3). As other terms appear throughout this monograph, definitions are provided in the footnotes. We have tried to write our monograph in such a way that definitions, and other clarifying material provided in the footnotes, can be largely ignored by the general reader. These definitions, and the Dictionary of the 1971 Census Terms which is available from Statistics Canada, should be scrutinized carefully, however, by anyone wishing to make further use of figures shown in this monograph.

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See footnote(s) on page 21.

FOOTNOTES

<sup>1</sup>The labour force consists of those persons 15 years of age and over (14 and over in 1951) who, in the week prior to enumeration, worked for pay or profit, helped without pay in a family business or farm, looked for work, were on temporary layoff or had jobs from which they were temporarily absent because of illness, vacation, strike, etc. Persons doing housework in their own homes, persons doing volunteer work, inmates of institutions and female farm workers who indicated they worked without pay in a family farm or business for less than 20 hours per week are not included in the labour force. The figures shown, with the exception of the growth figures, are calculated from the 1971 Census of Canada, Volume III - Part 1, Table 3, and include the Yukon and Northwest Territories. The growth figures are from data presented in Chapter 2.

<sup>2</sup>In the published Census data for 1951, 1961 and 1971, the category "married" includes all married persons whether living together or living apart for any reason unless a divorce has been obtained. However, some of the tables for married women are based on Public Use Sample data from the 1971 Census and include only those married women living with their husbands.

<sup>3</sup>Throughout most of this monograph we have used the terms "worked" and "currently working" somewhat differently from the way they are used, for instance, in the official 1971 Canadian Census publications. Except where indicated otherwise, we have used the term "worked" to mean "earned employment income in the calendar year of 1970"; while the term "currently working" is used to denote those who worked for pay or profit in the week prior to enumeration. In both cases, therefore, we are including the self-employed, but excluding those who helped without pay in a family business or farm. Thus all references throughout this monograph to wives who work or working wives refer to wives who work for pay or profit.

<sup>4</sup>The market labour force is defined in this monograph as the labour force (see footnote 1) excluding those who helped without pay in a family business or farm.

<sup>5</sup>The term "wage earners" excludes the self-employed.

<sup>6</sup>Geographic areas included in the Public Use Sample were restricted to areas with a minimum population of 250,000 persons. As a result, no data are included in the Public Use Sample for Prince Edward Island, the Yukon, and the Northwest Territories. Prince Edward Island is included in our tables calculated from summary census data published by Statistics Canada, but the Yukon and the Northwest Territories are generally not included. The 1951 Census labour force data published by Statistics Canada do not include the Yukon and the Northwest Territories, while the published data for 1961 and 1971 do. For 1961 our Canada totals were obtained by subtracting the figures for the Yukon and the Northwest Territories from the published totals for Canada, or where this was not possible due to lack of data for the Yukon and the Northwest Territories, by summing the data for the remaining 10 provinces. For 1971 all our Canada totals were obtained by summing the totals for the 10 provinces. As a result, in some instances, our percentages and distributions based on our Canada totals will differ slightly from those based on Canada totals published by Statistics Canada. Tables based on published data indicate the inclusion or exclusion of the Yukon and the Northwest Territories.

<sup>7</sup>Several of the relationships in this monograph are estimated using generalized least squares regression. In the case of these regressions the dependent variables are continuous variables. Moreover, in these generalized least squares regressions transformed variables have been created by multiplying the dependent and all the explanatory variables by weights chosen so that the error terms for our regressions will have constant variances. Probit analysis has been used whenever we are dealing with a qualitative dependent variable that can take on either of two states such as working or not working, employed or unemployed, and so forth.

<sup>8</sup>For an introductory statistics book, see for instance, Wonnacott and Wonnacott (1972).

## CHAPTER 2

### WHICH WIVES WORK?

#### 2.1. Introduction

We will now turn to the question of which wives work. We must first carefully define what we are referring to when we use the term "work". Except in Chapter 3, in this monograph wives are defined as having worked if they earned at least one dollar of employment income<sup>1</sup> in the calendar year of 1970. Wives who worked without pay at home or in a family business or who did volunteer work are not included in this group. Nor are we including in this group wives who looked for, but did not find, paid employment during 1970; that is, there are wives who participated in the labour force in 1970, but who did not work. Thus by work, what we really mean is paid work.

Whether or not a particular woman decides to work can be seen as depending on the wage she could receive if she did work, and on the wage she must receive to be willing to work. We will refer throughout this monograph to the wage she could receive as her offered wage, and the wage she must receive as her asking wage.

A woman's offered wage is believed to depend on certain personal characteristics, such as her formal education and previous job experience, as well as on general economic conditions over which the woman herself has little or no control. For example, the availability of jobs, and hence the wage rates employers have to pay to attract workers, will be affected by both the nature of the occupational-industrial structure in an area and the unemployment rate. Asking wages, on the other hand, reflect a balance between the need for additional family income and the cost to the family of obtaining that income. For example, a family with several small children may desire additional income beyond that which the husband's job provides. However, if the wife enters the labour force, alternative and potentially expensive means of childcare must be found. Thus, her asking wage will include or reflect this cost.

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See footnote(s) on page 53.

Given a woman's offered and asking wages, it seems reasonable to expect that she will work if her offered wage is greater than her asking wage. If the offered wage is equal to her asking wage, a woman will be indifferent whether she works or not. If a woman's offered wage is less than her asking wage, our expectation is that she will not work.

For 1971 we have Public Use Sample data from the Family File for one out of every 100 wives on some of the characteristics that presumably affect the offered and asking wage rates of these wives, and we also know whether or not each of these wives worked in 1970. In this chapter, we will show how these data can be used to obtain estimates of the relative impact of different characteristics associated with a married woman and the place where she lives on the probability that she will work for pay.

## 2.2. Factors Affecting a Married Woman's Offered Wage

The factors believed to affect the wage rate a woman could receive if she were willing to work can be divided into two broad groups. The first group consists of personal attributes that make a woman more or less desirable as a potential employee, given general labour market conditions. The second group consists of characteristics of the economy and labour market that affect the levels of demand for workers of different types.

Most of the previous studies of female labour force participation have concentrated on the first of these two groups of characteristics.<sup>2</sup> Such studies provide insight into the question of which women will work, given the labour market conditions. To the extent that the personal characteristics of the adult female population in Canada have changed, these studies may also provide a partial explanation for the increase in the percentage of women who choose to work outside the home. However, we believe that basic changes in the Canadian economy itself are at least as important in explaining this rise. In this chapter, we will provide evidence supporting this belief.

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See footnote(s) on page 53.

### 2.2.1. Personal Characteristics

The personal characteristics we will consider in this study are quite similar to those included in previous studies of female participation in the labour force, and are dictated in part by the availability of data. These characteristics are a woman's education,<sup>3</sup> the number of children under six years of age,<sup>4</sup> her age at first marriage<sup>5</sup> and her current age.

Years of formal education is included in the analysis in the belief that women with more education will tend to command higher wage rates than women with less education. Previous job experience is also believed to raise a woman's offered wage. Since no information on previous job experience was collected in the 1971 Census for women who worked in 1970,<sup>6</sup> we have had to use the number of children under six years of age and age at first marriage as proxies for the amount of experience and how recent it was.

A woman's current age may also be an important indicator of job experience, since the longer a woman has lived, the more opportunity she has had to participate in the labour force. Additionally, older women, particularly those re-entering the labour market after their children have grown up, may be seen by employers as more permanent or stable employees, and thus may be offered higher wages. On the other hand, older women have fewer potential years in which to work, which affects the relative cost of training them, and they may have more sick days because of deteriorating health. Rather than attempt to guess at the exact nature of the impact of age on offered wages, we have chosen to carry out our analysis separately for each of 11 age groups.

Table 2.1 shows the changing educational characteristics of adults not attending school, by sex, for 1951, 1961 and 1971. The figures presented for each of these three Census years are not directly comparable. Still, for each of the Census years, it is apparent that the percentages of women who have very little education and the percentages of women who have a great deal of education are consistently smaller than the comparable percentages for men. Moreover, it appears that the male-female percentage-point gaps for those with very little education have been closing over time, while the male-female gaps for those with more education

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See footnote(s) on page 53.

TABLE 2.1. Population 15 Years of Age and Over Not Attending School, by Level of Schooling and Sex, Canada,<sup>1</sup> 1951, 1961 and 1971

Level of schooling and sex	Year		
	1951	1961	1971
Percentage with elementary school or less			
Men	57.8	49.9	38.9
Women	49.6	43.7	35.6
Percentage with university degree			
Men	2.6	4.2	6.5
Women	1.0	1.7	2.9

<sup>1</sup>Figures are for persons 15 years and over. Data for 1971 include persons attending school on a part-time basis; such data were not collected in 1951 and 1961. Elementary school is nine years or less in 1951; 1961 and 1971 data are the census classifications, and do not include Grade 9 in 1971. University degree in 1951 refers to those with 17 years or more of schooling; 1961 and 1971 data are the census classifications. Data for 1951 are number of years attended; data for 1961 and 1971 are highest grade or year attended. Data in all three years include the Yukon and Northwest Territories.

Source: Calculated from 1951 Census of Canada, Vol. II, Table 27; 1961 Census of Canada, Vol. I - Part 3, Table 102; and 1971 Census of Canada, Vol. I - Part 5, Table 5.

have been widening with time. For both men and women, however, we see a steady decrease in the percentages with very little education, and a steady increase in the percentages with a great deal of education.

#### 2.2.2. Labour Market Characteristics

The unemployment rate<sup>7</sup> is one type of labour market characteristic that can be expected to influence the offered wage. When the unemployment rate is high (low), more (fewer) workers are competing for the available jobs and offered wages should be driven downward (upward). Other less transitory labour market characteristics can also affect offered wages.

It is well-known that women are occupationally segregated; that is, that they are clustered in certain occupations.<sup>8</sup> In addition, they are industrially segregated. This is because occupations are themselves clustered or segregated in certain industries. To use an extreme example, a greater percentage of sales clerks are found in the Trade industry than in primary industries such as Agriculture or Forestry.

The persistence of this industrial segregation over the period 1951-71 is shown in Table 2.2. Since the data in this table are only partially corrected for classification changes made by Statistics Canada during this period, it must be interpreted with caution.<sup>9</sup> We believe, however, that the data are sufficiently accurate to reveal broad patterns over time. For instance, despite some variation, women generally have made up 40% or more of the Finance and Community-Personal Service industries, close to 30% or more of the Trade industry, and 10% or less of the Forestry, Fishing and Trapping, Mining and Construction industries.

Looking at a somewhat different grouping of the same industrial categories shown in Table 2.2 we find that more than 60% of all women in the labour force have been found over the 1951-71 period in the Finance, Community-Personal Service and Trade industries, and less than 2% in the Forestry, Fishing and Trapping, Mining and Construction industries. Moreover, the more female-oriented industries have experienced percentage rates of growth greater than the rate for all industries, while the industries with small percentages of women have grown at rates slower than the rate for all industries.

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See footnote(s) on page 53.

TABLE 2.2. Industrial Distribution of Female and Total Labour Force, Canada,<sup>1</sup> 1951, 1961 and 1971

Industry	Percentage total growth	Percentage distribution of total labour force			Percentage distribution of female labour force			Women as percentage of total labour force		
	1951-71	1951	1961	1971	1951	1961	1971	1951	1961	1971
Agriculture	-41.8	15.6	9.9	5.6	3.0	4.5	3.8	4.2	12.3	23.2
Forestry	-42.8	2.5	1.7	0.9	0.2	0.1	0.1	1.8	2.0	4.5
Fishing and Trapping	-50.5	1.0	0.5	0.3	0.0	0.0	0.0	0.8	1.4	3.6
Mining	31.6	2.0	1.8	1.6	0.2	0.3	0.3	2.2	4.0	6.8
Manufacturing	25.4	25.7	21.7	19.8	23.6	17.1	13.7	20.2	21.5	23.7
Construction	53.1	6.6	6.7	6.2	0.5	0.6	0.9	1.7	2.5	4.9
Transportation	44.0	8.8	9.3	7.8	4.6	4.7	3.8	11.7	13.8	17.0
Trade	78.6	13.4	15.3	14.7	18.2	17.1	15.8	29.8	30.4	36.7
Finance	148.4	2.7	3.5	4.2	5.5	5.9	6.2	44.4	45.7	51.4
Community-Personal Service	163.5	14.6	19.5	23.7	38.4	42.4	39.7	57.8	59.3	57.6
Public Administration	109.1	5.8	7.4	7.4	4.6	4.9	5.5	17.8	18.0	25.5
Unspecified	905.4	1.3	2.4	7.9	1.1	2.4	10.2	19.3	26.5	44.2
All industries	62.8	100.0	100.0	100.0	100.0	100.0	100.0	22.0	27.3	34.3

<sup>1</sup>Data exclude the Yukon and Northwest Territories. See text for discussion of comparability of data.

Source: Calculated from 1951 Census of Canada, Vol. IV, Table 16; 1961 Census of Canada, Vol. III - Part 2, Table 1A; and 1971 Census of Canada, Vol. III - Part 4, Table 2.

Industries are not generally thought to grow because there are large numbers of available people who would like to work in those industries, although labour market conditions of this sort may be favourable to industrial growth. Rather industries grow because there is a demand for their products. This suggests that basic changes in the Canadian economy over the 1951-71 period have opened up increasing numbers of job opportunities for women, leading to higher offered wage rates for women and ultimately to increases in the percentage of women working for pay.<sup>10</sup>

However, industrial data give only part of the picture for women's work patterns. Despite the tendency for certain occupations to be clustered in certain industries, a given industry does contain a range of occupations. Thus, it would be possible for industrial segregation by sex to exist with or without comparable occupational segregation by sex.

Unfortunately, it is difficult to make occupational comparisons over time because the Census occupational codes changed somewhat from 1951-61, and very considerably from 1961-71. In order to make these comparisons we have reclassified the 1951 and 1961 occupational data into the 1971 codes (see Appendix A for details of this reclassification). Since this reclassification is not precise, the following results must be interpreted with caution. However, again, we believe that the gross patterns that can be observed in these data are meaningful.

The occupational data in Table 2.3 show a consistency similar to that found in the industrial data.<sup>11</sup> We see that women generally have made up 40% or more of the total labour force in Teaching, Medicine and Health, Clerical and Service occupations, and 10% or less of the total labour force for Natural Sciences and Engineering, Other Primary, Construction and Transport occupations. The women in the Teaching, Medicine and Health, Clerical and Service groups taken together are more than 60% of the female labour force, while the women in Natural Sciences and Engineering, Other Primary, Construction and Transport occupations are approximately 1% of the female labour force.

Additionally, since 1951, Teaching, Medicine and Health, Clerical and Service occupations have all grown faster than the growth rate for all occupations,

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See footnote(s) on page 53.

TABLE 2.3. Occupational Distribution of Female and Total Labour Force, Canada,<sup>1</sup> 1951, 1961 and 1971

Occupation	Percentage total growth	Percentage distribution of total labour force			Percentage distribution of female labour force			Women as percentage of total labour force		
	1951-71	1951	1961	1971	1951	1961	1971	1951	1961	1971
Managerial	-17.1	8.5	8.8	4.3	3.3	3.3	2.0	8.7	10.4	15.7
Natural Sciences, Engineering	250.8	1.3	2.1	2.7	0.4	0.4	0.6	6.9	4.8	7.3
Social Sciences	272.9	0.4	0.6	0.9	0.5	0.7	1.0	27.8	29.4	37.4
Religion	-23.0	0.6	0.5	0.3	1.0	0.6	0.1	39.7	28.9	15.7
Teaching	200.4	2.2	3.1	4.1	6.7	7.3	7.1	67.2	64.4	60.4
Medicine and Health	193.9	2.1	3.2	3.8	6.5	8.6	8.2	68.5	72.1	74.3
Artistic	124.1	0.7	1.0	0.9	0.9	1.1	0.7	30.7	31.2	27.2
Clerical	119.6	11.8	13.7	15.9	30.1	30.6	31.8	56.1	61.0	68.4
Sales	165.2	5.8	7.2	9.5	8.8	8.4	8.4	33.3	32.0	30.4
Service	91.8	9.5	11.4	11.2	19.5	19.5	15.1	45.1	46.7	46.2
Farming	-38.3	15.7	10.1	6.0	2.8	4.3	3.6	3.9	11.7	20.9
Other Primary	-28.8	4.0	2.8	1.8	0.0	0.0	0.1	0.1	0.3	1.3
Processing	-13.2	7.3	5.4	3.9	4.9	2.7	2.0	14.8	13.7	17.8
Machining and Fabricating	32.1	12.5	11.0	10.2	10.2	7.2	5.5	18.0	17.9	18.7
Construction	42.0	7.6	7.0	6.6	0.3	0.2	0.2	1.0	0.8	0.9
Transport	22.2	5.2	4.3	3.9	0.1	0.1	0.3	0.5	0.6	2.4
Other	153.3	3.6	5.4	5.6	2.7	2.7	2.6	16.3	13.6	15.7
Unspecified	1044.5	1.2	2.6	8.5	1.1	2.4	10.8	20.6	26.0	43.4
All occupations	62.8	100.0	100.0	100.0	100.0	100.0	100.0	22.0	27.3	34.3

<sup>1</sup>Data exclude the Yukon and Northwest Territories.

Source: Calculated from 1951 Census of Canada, Vol. IV, Table 4; 1961 Census of Canada, Vol. III - Part 1, Table 6; and 1971 Census of Canada, Vol. III - Part 2, Table 8.

while Other Primary, Construction and Transport occupations have been growing less rapidly than the overall growth rate, although the Natural Sciences and Engineering group has experienced a growth rate greater than the overall rate. Thus, we again find that, on the whole, women are represented most heavily in occupations that have grown particularly rapidly since 1951. We also again find evidence that, although there have been changes over time in the percentages of women to the total labour force in each occupation, these changes have done little to alter the basic pattern of occupational segregation, or segmentation, by sex.<sup>12</sup>

The above discussion concerns the industrial and occupational segregation of all women, not married women. Although the married female labour force has grown even more rapidly than the total female labour force (using our data, 407.8% from 1951-71 for married women compared to 153.8% for all women), the same patterns of industrial and occupational segregation have persisted.

Table 2.4 shows the percentage distributions and growth by industry for the married and non-married (single, widowed and divorced) female labour forces in the years 1951, 1961 and 1971. The yearly distributions are not significantly different in a statistical sense, although comparatively more married women are found in the Agriculture,<sup>13</sup> Manufacturing and Trade industries, and more non-married women are found in the Transportation, Finance, Community-Personal Service and Public Administration categories. However, the size of these differences have declined from 1951-71. This is partly because the greatest industry-specific growth in the married female labour force has tended to occur in those industries in which married women have been under-represented compared to non-married women. This, plus a markedly different growth pattern in the Manufacturing industry, is the explanation for the significant difference in overall growth patterns for the industry-specific married and non-married female labour forces.<sup>14</sup>

Similar patterns emerge when the distributions and growth patterns for occupations are examined (see Table 2.5). Although the yearly distributions are not significantly different in a statistical sense, the growth patterns are.<sup>15</sup> The statistical analysis shows this is primarily due to differences in the growth rates in the Processing occupations. In addition, there have been reductions in the size

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See footnote(s) on page 53.

TABLE 2.4. Percentage Distributions and Growth for Married and Non-married Women in the Labour Force, by Industry, Canada,<sup>1</sup> 1951, 1961 and 1971

Industry	1951		1961		1971		Percentage growth 1951-71	
	Married	Non-married	Married	Non-married	Married	Non-married	Married	Non-married
Agriculture	4.9	2.2	7.1	1.8	5.0	1.9	419.1	27.6
Forestry	0.3	0.1	0.2	0.1	0.1	0.1	94.1	- 4.6
Fishing and Trapping	0.0	0.0	0.0	0.0	0.0	0.0	427.3	6.8
Mining	0.2	0.2	0.2	0.3	0.3	0.3	686.6	139.1
Manufacturing	25.8	22.6	18.3	16.0	14.7	12.1	189.8	-22.4
Construction	0.6	0.5	0.7	0.5	1.0	0.7	753.1	108.2
Transportation	3.5	5.1	4.2	5.2	3.6	4.2	422.1	18.0
Trade	22.4	16.4	20.1	14.1	16.7	14.3	279.5	26.7
Finance	4.2	6.1	5.2	6.7	6.1	6.5	642.2	54.4
Community-Personal Service	33.7	40.3	38.6	46.2	37.8	42.5	469.4	53.0
Public Administration	3.5	5.1	4.3	5.5	5.1	6.2	629.1	74.6
Unspecified	0.8	1.3	1.1	3.7	9.5	11.2	5942.8	1194.3
All industries	100.0	100.0	100.0	100.0	100.0	100.0	407.8	45.1

<sup>1</sup>Data exclude the Yukon and Northwest Territories.

Source: Calculated from 1951 Census of Canada, Vol. IV, Tables 16 and 19; 1961 Census of Canada, Vol. III - Part 2, Tables 1A and 9; and 1971 Census of Canada, Vol. III - Part 4, Table 2, and Part 5, Table 1.

TABLE 2.5. Percentage Distributions and Growth for Married and Non-married Women in the Labour Force, by Occupation, Canada,<sup>1</sup> 1951, 1961 and 1971

Occupation	1951		1961		1971		Percentage growth 1951-71	
	Married	Non-married	Married	Non-married	Married	Non-married	Married	Non-married
Managerial	5.7	2.3	4.3	2.4	1.9	2.1	70.2	28.6
Natural Sciences, Engineering	0.3	0.4	0.3	0.4	0.5	0.7	839.7	131.3
Social Sciences	0.4	0.6	0.5	0.9	0.8	1.3	936.9	243.5
Religion	0.1	1.5	0.1	1.0	0.0	0.3	106.0	-72.8
Teaching	4.6	7.6	6.0	8.6	7.4	6.7	715.9	28.6
Medicine and Health	4.2	7.5	6.7	10.4	7.9	8.6	855.0	65.8
Artistic	1.0	0.9	1.0	1.2	0.6	0.9	239.5	37.6
Clerical	25.3	32.1	28.8	32.4	31.1	32.8	522.3	48.1
Sales	11.2	7.7	10.3	6.5	9.0	7.4	306.4	39.8
Service	20.9	18.9	19.8	19.1	14.2	16.5	245.0	26.3
Farming	4.7	2.0	6.9	1.7	4.8	1.8	421.6	32.8
Other Primary	0.0	0.0	0.0	0.0	0.0	0.0	1245.7	421.9
Processing	5.5	4.7	3.0	2.4	2.2	1.7	105.4	-46.5
Machining and Fabricating	11.7	9.6	8.2	6.3	6.3	4.5	170.4	-32.9
Construction	0.4	0.3	0.2	0.2	0.2	0.2	103.2	- 8.1
Transport	0.2	0.1	0.1	0.1	0.3	0.2	916.9	248.4
Other	2.9	2.5	2.6	2.8	2.7	2.3	357.4	36.3
Unspecified	0.8	1.3	1.1	3.8	10.0	11.9	6039.4	1268.0
All occupations	100.0	100.0	100.0	100.0	100.0	100.0	407.8	45.1

<sup>1</sup>Data exclude the Yukon and Northwest Territories.

Source: Calculated from 1951 Census of Canada, Vol. IV, Tables 4 and 11; 1961 Census of Canada, Vol. III - Part 1, Tables 6 and 17; and 1971 Census of Canada, Vol. III - Part 2, Table 8.

of the differences between the percentages of married versus non-married women in several of the female-oriented occupations, such as Teaching, Medicine and Health, Clerical and Sales.

To summarize, although the growth patterns are different, the patterns of industrial and occupational segregation are similar for both married and non-married women. This suggests that our earlier conclusion - that more job opportunities have become available to women over time because of the above-normal growth rates of those industries and occupations in which women form a larger percentage of the labour force - is valid for married women as well as for all women considered together.

The concept of job opportunities has been used in previous studies to explain differences in participation rates between rural and urban areas, the rationale being that urban areas have greater job opportunities for women. There has been a population shift from rural to urban areas in the period 1951-71. We find that 76.1% of the population lived in urban areas in 1971, compared to 68.1% in 1951; the figures for married women are 77.5% and 64.8%, respectively. It can thus be argued that, along with the country-wide growth over time in women's job opportunities, there has been a population shift to those areas of the country that offer relatively more of these job opportunities.

Do urban areas have more job opportunities on a per woman basis? In Table 2.6 we show the ratio of the expected number of jobs for women compared to the number of women 15 years of age and older, by province and place of residence. The expected number of women in each occupation or industry in each province or place of residence is calculated by multiplying the 1971 Canada-wide percentages of women in each occupation or industry by the actual number of men and women in each occupation or industry in each province or place of residence who earned employment income in the calendar year 1970. The expected number of women in each occupation or industry for each province and place of residence is then summed to obtain a proxy for the total number of expected jobs for women by province and place of residence. These totals are then divided by the total number of women 15 years of age and older in each province and place of residence.<sup>16</sup>

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See footnote(s) on page 53.

TABLE 2.6. Ratio of Expected Jobs for Women to Number of Women 15 Years of Age and Older, by Province and Place of Residence, 1971

Province	Urban				Rural			
	30,000 and over		Under 30,000		Non-farm		Farm	
	Industry	Occupation	Industry	Occupation	Industry	Occupation	Industry	Occupation
Newfoundland	.42	.45	.32	.34	.24	.20	.21	.19
Nova Scotia	.45	.50	.38	.38	.32	.29	.34	.30
New Brunswick	.45	.48	.38	.39	.32	.28	.30	.29
Quebec	.41	.42	.36	.35	.29	.26	.20	.17
Ontario	.48	.49	.42	.41	.37	.35	.29	.26
Manitoba	.48	.50	.41	.41	.34	.32	.20	.18
Saskatchewan	.47	.48	.41	.39	.29	.27	.17	.15
Alberta	.49	.51	.44	.43	.33	.32	.20	.17
British Columbia	.45	.45	.41	.40	.37	.36	.36	.33

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Individual File.

Looking at either the occupational or industrial ratios in Table 2.6, we see a clear pattern of more job opportunities per woman in urban than in rural areas. Moreover, there are also more job opportunities per woman in large cities than in smaller cities, and in rural non-farm areas than in rural farm areas.

It should be noted that the actual differences between provinces and places of residence in terms of job opportunities per woman are not due solely to differences in industrial and occupational structure. They are also the result of provincial, and perhaps place of residence, differences in the percentages of women in the different industries and occupations. However, these percentages are very similar from one province to another. For example, the percentage of women compared with the total labour force in the Community-Personal Service industry in 1971 ranges from a high of 61.9% in New Brunswick to a low of 53.8% in Newfoundland, and the national figure is 57.6%. Similarly, women as a percentage of the total labour force in the Medicine and Health occupations ranges from a high of 78.2% in New Brunswick to a low of 71.1% in Quebec, with the national figure at 74.3%.

Relating our job opportunities index to women's offered wages, we would expect offered wages to be bid up in areas with a relatively small number of women competing for each job available to them. Likewise we would expect offered wages to be bid down in areas where this situation is reversed. In other words, in areas where the ratio of expected jobs to numbers of women is high, such as urban Alberta, offered wages are expected to be high compared with areas where the ratio is low, such as rural Newfoundland.

In summary, therefore, the variables included in our study to describe labour market conditions are the provincial unemployment rate,<sup>17</sup> and the occupational local opportunity for jobs index for which values are shown in Table 2.6.

### 2.3. Factors Affecting a Married Woman's Asking Wage

The factors believed to affect a wife's asking wage - that is, the wage she must receive to be willing to work - can also be divided into two broad groups. The first group consists of factors that determine the cost to the woman and her family if she works for pay outside the home. The second group are those factors that

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See footnote(s) on page 53.

indicate the need for additional income beyond that which the husband can earn, plus those factors that determine the number of hours the wife must work in order to earn any given amount of additional income.

### 2.3.1. Cost Factors

When a wife works outside the home, either she or her family must replace, rearrange or compensate for the loss of the work she has been doing inside the home. The cost of this replacement will depend on the amount and type of work the wife has been doing in the home. It will also depend on the number of hours she works outside the home.

The amount of work a wife does in the home is largely dependent on the number and ages of her children. Thus, a family with several young children faces greater replacement costs than does a family with fewer or older children. This is especially true as the number of hours the wife works outside the home increases. For instance, it may well be more difficult to arrange for alternative childcare for, say, 40 hours per week as compared to 15 hours per week. While market mechanisms have produced a variety of substitutes for many household tasks, such as laundry and food preparation, this has not been the case so much with childcare. In addition, for most people, the quality of substitutes for caring for a child oneself is more crucial than the quality of substitutes for other household tasks.

In this study, we have included three proxy variables for this replacement cost. These are the number of children less than six years of age, the number of children 6-14 years of age, and an interaction term that is the product of these two numbers. This interaction term is included partially to account for non-linearities in the decline in the amount of time spent per additional child as both the total number and the ages of the children increase. It is interesting to examine changes in childbearing patterns over time. As can be seen in Table 2.7, there has been very little change from 1951-71 in the average two-parent family size. However, we also see that this apparent stability in family size masks a substantial decline in the percentage of families with children under six years of age.

In addition to the financial costs of childcare alternatives, there may also be psychological costs. For instance, a wife may experience guilt about working outside the home when her children are young. Other psychological costs reflect

TABLE 2.7. Average Number of Persons per Two-parent Family and Percentage of Families with Children Under Six Years of Age, by Province, 1951 and 1971

Province	Average number of persons per two-parent family		Percentage of families with children under six years of age	
	1951	1971	1951	1971
Newfoundland	4.5	4.5	93.3	68.6
Prince Edward Island	4.2	4.1	72.0	49.5
Nova Scotia	4.0	3.9	66.4	46.3
New Brunswick	4.3	4.1	78.4	49.5
Quebec	4.3	4.0	74.5	43.2
Ontario	3.5	3.6	51.0	40.9
Manitoba	3.6	3.7	55.1	43.5
Saskatchewan	3.8	3.8	59.7	44.3
Alberta	3.7	3.8	61.0	47.5
British Columbia	3.3	3.5	48.8	39.2
Canada <sup>1</sup>	3.8	3.8	61.1	43.2

<sup>1</sup>Data exclude the Yukon and Northwest Territories.

Source: 1951 Census of Canada, Vol. III, Tables 131 and 136; and 1971 Census of Canada, Vol. II - Part 2, Table 51.

cultural and personal differences that make a woman averse to, or fearful of, entering the labour force. For example, it has been argued that French Canadians and Roman Catholics have more conservative attitudes toward wives with paid employment. If this is the case, the asking wage for women from French-speaking or Catholic families should be higher in order to compensate for, or justify, their non-traditional behaviour. Similarly, women who have been out of the labour force for many years may be reluctant to re-enter. As proxies for these psychological costs we have included the total number of children ever born to a wife, and dummy variables<sup>18</sup> for whether or not the wife's religion is Roman Catholic, and whether or not she lives in a family whose head has indicated that French is the language most often used at home (hereafter we often refer to these households as "French-speaking households").

As mentioned earlier, the number of hours actually worked outside the home also affects the asking wage. The greater the number of hours the wife works outside the home, the more difficult or costly it is to replace the services, whether child-care or other tasks, she can no longer provide, and the higher her asking wage should be.

#### 2.3.2. Need Factors

A family's need for additional income would appear to increase as the husband's income decreases, as family asset income decreases, as financial obligations increase, as the number of children increases and as the parents' aspiration level increases. Interactions among the husband's income, the number of children and aspirations may complicate these relationships, since families where the husband earns a high income tend to be families with high aspirations and a low number of children, and vice versa.

In this study, we have included separate terms for the yearly employment income of the husband,<sup>19</sup> and the asset income of the family.<sup>20</sup> Our expectation is that increases in either or both of these variables should act to increase the wife's asking wage, since the family's need for additional income will be less. We have also included an interaction term that is created by adding the husband's employment income and the family's asset income, and then dividing this total by the number of people in the family.

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See footnote(s) on page 53.

The only variable acting solely as a proxy for financial obligations is the number of children 19-24 years of age who are attending school. As the number of such children being supported by the family increases, we would expect the wife's asking wage to decrease.

If the wife does work to earn additional income for the family, the number of hours she will have to work to earn any given level of income will be determined by her offered wage rate. Thus, for wives who work, the offered wage itself should enter into the relationship determining the asking wage. Our expectation is that working wives with higher offered wages will also have higher asking wages, all other factors being equal.

#### 2.4. Offered and Asking Wage Rates and the Probability of Working

Our expectation is that a woman will work if her offered wage is greater than her asking wage at zero hours of work. Thus, a woman will be more likely to work the higher the wage rate employers are willing to offer her, and the lower the wage for which she is willing to work.

Table 2.8 summarizes our hypotheses about those factors previously discussed that are expected to have some effect on a wife's offered wage, her asking wage or both. Factors that increase the offered wage, or decrease the asking wage or both will increase the probability of working. Factors that decrease the offered wage, or increase the asking wage or both will decrease the probability of working.

The basic data for our study of the probability of a wife working consist of the 40,665 records for husband-wife families living in Canada and maintaining their own households with no non-family people present, which are contained in the 1% Family File of the Public Use Sample drawn from the 1971 Census of Canada. These records were divided into eleven groups according to the age of the wife: 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64 and 65+.

In most previous Canadian studies it has been assumed that there is a linear relationship between the explanatory variables and the probability that a wife works or participates in the labour force.<sup>21</sup> However, this assumption raises some

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See footnote(s) on page 53.

TABLE 2.8. Summary of Hypotheses

Explanatory variables	Expected sign of impact		
	Offered wage	Asking wage	Probability of working
1. Years of education	+		+
2. Number of children less than six years of age	-	+	-
3. Number of children 6-14 years of age		+	-
4. Product of numbers of children less than six and 6-14 years of age		-	+
5. Number of children 19-24 years of age attending school full- or part-time		-	+
6. Number of children ever born		+	-
7. Employment income of husband		+	-
8. Asset income of family		+	-
9. Employment income of husband plus asset income of family divided by number of persons in family		?	?
10. Age of wife at first marriage	+		+
11. Dummy variable set equal to 1 if religion of wife is Roman Catholic, and equal to 0 otherwise		+	-
12. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise		+	-
13. Provincial unemployment rate	-		-
14. Local opportunity for jobs index	+		+
15. Dummy variable set equal to 1 if family lives in rural area, and equal to 0 otherwise	-		-

technical problems. Consider a group of wives with so little education and so many children that their probability of working is essentially zero. Now consider another group of wives with even less education and even more children. The probability that these wives will work is also essentially zero. Thus, although both groups have the same value for the dependent variable (the probability of working), they have different values for the explanatory variables. A similar problem occurs at the other extreme when we consider groups of wives with differing levels of so much education and so few children that their probability of working is virtually 1.0. Again we have groups of women with the same value for the dependent variable, but differing values for the explanatory variables. These situations cannot be represented by a linear model, since such a model specifies that a one-unit change in the value of an explanatory variable will always produce a change in the dependent variable equal to the coefficient of that explanatory variable.

This problem does not exist for wives whose probability of working is between the two extremes of zero and one. If most wives fell into this intermediate category, the assumption of a linear relationship might be quite adequate. However, only 37.0% of all Canadian wives were in the labour force in 1971.<sup>22</sup> We have, therefore, used a technique called "probit analysis" which specifically accounts for departures from linearity as the dependent variable approaches the extreme values of zero or one.

In probit analysis we first calculate an index value for each individual based on that individual's associated characteristics, and then find the cumulative probability of randomly drawing a value of a standard normal variable less than or equal to this index value.<sup>23</sup> Thus, for very large index values the estimated probability will always be approximately one, while for very small index values the estimated probability will always be approximately zero. In between these extremes, the probability will be larger the larger the value of the index. The coefficients shown in our tables of estimated probit coefficients are the coefficients of our indices, which are then used to calculate the associated probabilities. A one-unit increase in the value of one of the variables in the equation for our index will change the value of the index by an amount equal to the coefficient of this variable; it will not change the value of the associated probability by an amount equal to

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See footnote(s) on page 53.

this coefficient. Thus the dependent variables for our probit tables are really indices, which in turn are related to probabilities by the cumulative normal probability table.<sup>24</sup>

Since our opportunity for jobs index has not been included in previous studies of female labour force behaviour, we have first estimated our model with and without this variable for the three age groups 15-19, 20-24 and 25-29. Columns 1, 3 and 5 of Table 2.9 show the coefficients of all explanatory variables with the opportunity for jobs index included; the coefficients with this variable omitted are shown in Columns 2, 4 and 6. In all cases, the coefficients are shown together with t-statistics which indicate the significance level of the coefficient; that is, the level of certainty with which we can conclude that the particular variable belongs in the model.

Comparing the results with and without the opportunity for jobs index, it is apparent that, for each age group, the estimated coefficients of most variables are virtually unchanged when the opportunity for jobs index is omitted. The exceptions are the coefficients for the unemployment variable and the urban-rural variable. When the opportunity for jobs variable is included, the coefficients for the urban-rural variable are not significant at even a confidence level as low as 80%; while the coefficients for the unemployment rate variable are significant at this low level for two of the three age groups, but are not significant for any age group at the 90% level. When the opportunity for jobs index is omitted, the coefficients for both the unemployment and urban-rural variables become markedly larger in absolute value, and are all significant at the 99% level. Thus it would appear that the opportunity for jobs variable does belong in our model. Furthermore, when this variable is excluded, some of its effects are attributed to the unemployment and urban-rural variables. Since the coefficients for the urban-rural variable are never significant at the 80% level when the opportunity for jobs variable is included, we have carried out the rest of our analysis using a model that includes the opportunity for jobs variable and omits the urban-rural variable.

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See footnote(s) on page 53.

TABLE 2.9. Probit Estimates for Full Model With and Without Opportunity for Jobs Index

Explanatory variables	Age groups					
	15-19		20-24		25-29	
	With jobs index	Without jobs index	With jobs index	Without jobs index	With jobs index	Without jobs index
1. Constant	-6.1108 (5.04) <sup>1</sup>	-4.9286 (4.81)	-1.4572 (3.79)	-.35867 (1.23)	-.89190 (2.85)	-.21927 (.98)
2. Years of education	.01925 (.64)	.02755 (.93)	.05359 (6.05)	.05469 (6.19)	.08773 (12.16)	.08836 (12.26)
3. Number of children less than six years of age	-.15702 (.99)	-.17934 (1.15)	-.47439 (8.84)	-.48424 (9.06)	-.38142 (7.57)	-.39139 (7.80)
4. Number of children 6-14 years of age			-.14035 (1.03)	-.13063 (.96)	-.12975 (2.52)	-.13632 (2.66)
5. Product of numbers of children less than six and number 6-14 years of age			-.17120 (1.72)	.16966 (1.72)	.11908 (4.95)	.11951 (4.97)
6. Number of children 19-24 years of age attending school full- or part-time <sup>2</sup>						
7. Number of children ever born					-.10115 (2.93)	-.09993 (2.89)
8. Employment income of husband	-.00007 (.83)	-.00007 (.74)	-.00016 (6.52)	-.00015 (6.33)	-.00011 (8.32)	-.00010 (8.15)
9. Asset income of family	-.00031 (1.65)	-.00028 (1.55)	-.00011 (2.14)	-.00010 (2.00)	-.00009 (3.99)	-.00009 (3.89)
10. Employment income of husband plus asset income of family divided by number of persons in family	.00037 (1.75)	.00036 (1.68)	.00037 (5.67)	.00036 (5.58)	.00022 (5.73)	.00021 (5.62)
11. Age of wife at first marriage	.30381 (5.19)	.29308 (5.04)	.05706 (4.25)	.05714 (4.27)	.01913 (2.15)	.01954 (2.20)
12. Dummy variable set equal to 1 if religion of wife is Roman Catholic, and equal to 0 otherwise	-.06803 (.51)	-.06553 (.49)	.03257 (.61)	.02821 (.53)	.13062 (2.81)	.12873 (2.77)
13. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise	.10652 (.56)	.09643 (.51)	-.19061 (2.80)	-.19009 (2.79)	-.28318 (4.83)	-.28754 (4.91)
14. Provincial unemployment rate	-.05666 (1.46)	-.08810 (2.54)	-.02681 (1.65)	-.06510 (4.74)	-.01270 (.89)	-.03562 (2.92)
15. Local opportunity for jobs index	1.9922 (1.84)		2.0086 (4.37)		1.2383 (3.08)	
16. Dummy variable set equal to 1 if family lives in rural area, and equal to 0 otherwise	-.24358 (1.20)	-.53619 (4.24)	-.03497 (.40)	-.33830 (6.25)	-.07950 (1.03)	-.26779 (3.55)
Pseudo R <sup>2</sup>	.2078	.2033	.2640	.2609	.2376	.2363
Maximum R <sup>2</sup>	.7484	.7484	.7284	.7284	.7495	.7495
Pseudo R <sup>2</sup> for model (pseudo R <sup>2</sup> divided by maximum R <sup>2</sup> for model)	.2777	.2717	.3624	.3581	.3170	.3153
Number of married women in sample	607		4438		5541	
Number of married women who worked	328		2853		2651	
Proportion of married women who worked	.54		.64		.48	
Final value of log of likelihood function	-348.06	-349.78	-2212.5	-2221.7	-3083.9	-3088.7

<sup>1</sup>Numbers in parentheses are (asymptotic) t-statistics. A coefficient is significant with at least a 95% level of confidence if its t-statistic is greater than or equal to 1.96.

<sup>2</sup>Variable Number 6 was not included for age groups 15-19, 20-24 and 25-29.

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Family File.

## 2.5. The Impact of Selected Variables on the Probability a Wife Will Work

The probit coefficients for our final model are shown in Table 2.10. Looking only at those coefficient estimates that are significant at at least a 95% confidence level, we find that a wife is more likely than the average wife in her age group to work if she has more years of education, has fewer children under six years of age, has fewer children 6-14 years of age, has more children 19-24 who are attending school, has fewer children ever born, has a husband with a lower employment income, is in a family with a smaller amount of asset income, was married at a later age, is Roman Catholic, does not live in a French-speaking home, lives in a province with a low unemployment rate, and lives in an area with a high value of our opportunity for jobs index. The coefficients for the product of the number of children aged less than six and the number aged 6-14 are positive for all age groups for which this variable is included.<sup>25</sup> This indicates that, with the birth of a new child, there is less of a decline in the probability that a wife will work if she already has some children in the 6-14 age bracket than if this is the first child, or if all her other children are still under six years of age. The coefficients for the interaction term created by dividing the employment income of the husband plus the family asset income by the number of people in the family are positive for all age groups where these coefficients are significant at the 95% confidence level. The implication of this result is that the decline in the probability that the wife will work as the husband's income or family asset income increases will be less steep the smaller the number of children.

The only surprising results in Table 2.10 are the significantly positive coefficients for the variable measuring whether or not the wife is Roman Catholic. In the past, it has been suggested that the overall labour force participation of Canadian wives is lower than that of their United States counterparts partly because of the greater proportion of Roman Catholics in the Canadian population. Our results show that the probability that a wife will work declines sharply as the number of children increases. Hence, to the extent that Roman Catholics tend to have more children, our study supports the above hypothesis regarding lower participation rates. However, our results also show that English-speaking Roman Catholic wives with child-bearing patterns similar to other wives in their age groups seem to have higher than average probabilities of working.<sup>26</sup> Only French-speaking wives seem to

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See footnote(s) on page 53.

TABLE 2.10. Probit Estimates for Final Model

Explanatory variables	Age groups										
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
1. Constant	-6.7501 (6.18) <sup>1</sup>	-1.5413 (4.75)	-1.0747 (4.18)	- .4686 (2.01)	- .5412 (2.57)	- .6266 (3.14)	-1.0731 (5.50)	-1.5073 (7.46)	-1.7625 (7.64)	-1.8094 (5.83)	-1.6577 (4.65)
2. Years of education	.01553 (.52)	.05360 (6.05)	.08769 (12.15)	.05930 (8.47)	.06220 (8.90)	.05781 (8.29)	.06526 (9.27)	.06202 (7.88)	.07665 (9.15)	.06424 (6.65)	.05481 (5.34)
3. Number of children less than six years of age	- .15140 (.96)	- .47445 (8.84)	- .38062 (7.56)	- .45598 (9.47)	- .42017 (8.33)	- .40562 (6.71)	- .57374 (5.50)				
4. Number of children 6-14 years of age		- .14255 (1.05)	- .12981 (2.53)	- .12613 (3.61)	- .09622 (3.78)	- .15692 (6.59)	- .15074 (5.78)	- .09435 (2.80)	- .10904 (1.44)		
5. Product of numbers of children less than six and 6-14 years of age		.17153 (1.73)	.11878 (4.94)	.02812 (1.61)	.04627 (2.68)	.06438 (2.89)	.14583 (3.74)				
6. Number of children 19-24 years of age attending school full- or part-time				- .43377 (.88)	.31694 (2.64)	- .00969 (.21)	.08168 (2.07)	.06608 (1.41)	.25307 (3.98)	.31429 (2.49)	- .50610 (.95)
7. Number of children ever born			- .10171 (2.94)	.00120 (.04)	.00257 (.13)	- .00750 (.48)	- .01539 (1.09)	- .01018 (.72)	- .00144 (.10)	- .00849 (.53)	- .03102 (1.93)
8. Employment income of husband	- .00008 (.85)	- .00016 (6.52)	- .00011 (8.32)	- .00008 (7.32)	- .00005 (6.26)	- .00003 (4.42)	- .00004 (6.19)	- .00003 (3.85)	- .00006 (4.56)	- .00001 (.54)	.00005 (1.60)
9. Asset income of family	- .00032 (1.74)	- .00011 (2.15)	- .00009 (4.01)	- .00007 (2.43)	- .00002 (.91)	- .00001 (.48)	- .00004 (2.70)	- .00003 (2.11)	- .00007 (3.99)	- .00007 (2.89)	- .00004 (1.13)
10. Employment income of husband plus asset income of family divided by number of persons in family	.00038 (1.78)	.00037 (5.67)	.00022 (5.74)	.00015 (3.71)	.00007 (2.12)	- .00001 (.46)	.00003 (1.38)	.00002 (.87)	.00007 (2.33)	.00003 (.66)	- .00001 (.18)
11. Age of wife at first marriage	.31025 (5.32)	.05712 (4.26)	.01914 (2.15)	.00566 (.78)	- .01070 (1.72)	- .00842 (1.61)	.00246 (.54)	.01190 (2.79)	.00508 (1.09)	.00355 (.57)	- .01181 (1.88)
12. Dummy variable set equal to 1 if religion of wife is Roman Catholic, and equal to 0 otherwise	- .06308 (.47)	.03355 (.63)	.13333 (2.87)	.14817 (3.04)	.09100 (1.85)	.06951 (1.41)	- .02305 (.44)	- .11172 (1.82)	.02656 (.39)	.03333 (.39)	.09840 (.99)
13. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise	.11770 (.62)	- .18996 (2.79)	- .28181 (4.81)	- .02645 (4.25)	- .37995 (5.83)	- .28805 (4.46)	- .27978 (4.05)	- .18852 (2.42)	- .34799 (3.93)	- .38340 (3.43)	- .10204 (.77)

See footnote(s) at end of table.

TABLE 2.10. Probit Estimates for Final Model - Concluded

Explanatory variables	Age groups										
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
14. Provincial unemployment rate	-.04363 (1.17)	-.02425 (1.62)	-.00715 (.54)	-.03658 (2.70)	-.02756 (2.04)	-.03214 (2.38)	-.02372 (1.77)	-.02408 (1.65)	-.01529 (.94)	-.01126 (.55)	-.02486 (1.05)
15. Local opportunity for jobs index	3.0111 (4.42)	2.1542 (7.59)	1.5596 (6.23)	1.4418 (5.72)	1.7610 (7.21)	2.1074 (8.70)	2.1986 (9.00)	2.0307 (7.73)	2.1032 (7.06)	1.2156 (3.20)	1.1135 (2.50)
Combined grouped $R^2 = .9072^2$											
Pseudo $R^2$	.2059	.2639	.2375	.1543	.1184	.1137	.1247	.0863	.0926	.0570	.0348
Maximum $R^2$ for model	.7484	.7284	.7495	.7395	.7351	.7426	.7442	.7364	.7180	.6582	.4347
Pseudo $R^2$ for model (pseudo $R^2$ divided by maximum $R^2$ for model)	.27515	.36232	.31685	.20873	.16106	.15305	.16754	.11718	.12904	.08665	.07997
Number of married women in sample	607	4438	5541	4762	4613	4570	4476	3509	2941	2159	3049
Number of married women who worked	328	2853	2651	1879	1755	1896	1900	1352	965	492	252
Proportion of married women who worked	.54	.64	.48	.40	.38	.41	.42	.38	.33	.23	.08
Final value of log of likeli- hood function	-348.79	-2212.6	-3084.4	-2803.3	-2773.7	-2825.4	-2753.2	-2180.8	-1718.2	-1095.4	-815.6

<sup>1</sup>Numbers in parentheses are (asymptotic) t-statistics. A coefficient is significant with at least a 95% level of confidence if its t-statistic is greater than or equal to 1.96.

<sup>2</sup>Explained in Chapter 4, Section 4.5.

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Family File.

have generally lower than average probabilities of working, even after controlling for child-bearing patterns.

For any one age group, the relative impacts of the explanatory variables on the probability of a wife working depend only on the coefficient magnitudes and the relevant units of change for each of the explanatory variables. However, it is somewhat difficult to see directly from this table what the numerical increase or decrease would be in the probability of a wife working given a change of some specified size in one of the explanatory variables. Nor is it easy to compare the implications for different age groups of a given change in the magnitude of an explanatory variable. As noted previously, this is because when we multiply the probit coefficients for a woman in a given age group times the appropriate values for her of the explanatory variables and sum the results what we get is an index value, not this woman's probability of working. To find the expected probability that this woman will work we now must use a cumulative normal probability table to find the probability of getting a value less than or equal to the index value calculated for this woman. This probability is her estimated or expected probability of working.

Because of the shape of the cumulative normal distribution, a change of any specified magnitude in the value of the index will have a different impact on the probability of working, depending on the initial value of the index. For instance, if the proportion of women who work in an age group is 0.48, corresponding to a mean index value for the group of -0.05, then a change of +0.5 in the value of the index will increase the expected probability of working by +0.19, while a change of +1.0 in the index will increase the expected probability by +0.35. If the proportion of women who work is 0.38, corresponding to a mean index value for the group of -0.31, a change of +0.5 in the index will increase the expected probability by +0.20, while a change of +1.0 in the index will increase the expected probability by +0.38. If the proportion of women who work is 0.08, corresponding to a mean index value for the group of -1.41, a change of +0.5 in the index will increase the expected probability by +0.10, while a change of +1.0 in the index will increase the expected probability by +0.26.

Table 2.11 shows the expected changes for each age group in the probability of working, or the proportion of working women, given specified changes in the mean

TABLE 2.11. Expected Changes in the Proportions of Working Wives Given Specified Changes in the Mean Value of Each Explanatory Variable

Explanatory variables	Unit change	Age groups											Range of expected changes associated with probit coefficient estimates found to be significant with a 95% level of confidence
		15-19 (.54) <sup>1</sup>	20-24 (.64)	25-29 (.48)	30-34 (.40)	35-39 (.38)	40-44 (.41)	45-49 (.42)	50-54 (.38)	55-59 (.33)	60-64 (.23)	65+ (.08)	
1. Years of education	+ 1 year	.006 <sup>2</sup>	.020	.035	.023	.024	.023	.026	.024	.028	.020	.008	.008 to .035
2. Number of children less than six years of age	+ 1 child	-.060 <sup>2</sup>	-.186	-.147	-.160	-.146	-.146	-.201					-.146 to -.201
3. Number of children 6-14 years of age	+ 1 child		-.054 <sup>2</sup>	-.051	-.048	-.036	-.060	-.058	-.035	-.038 <sup>2</sup>			-.035 to -.060
4. Product of numbers of children less than six and 6-14 years of age	+ 1		.062 <sup>2</sup>	.047	.011 <sup>2</sup>	.018	.025	.058					.018 to .058
5. Number of children 19-24 years of age attending school full- or part-time	+ 1 child				-.154 <sup>2</sup>	.124	-.004 <sup>2</sup>	.032	.025 <sup>2</sup>	.096	.106	-.052 <sup>2</sup>	.032 to .124
6. Number of children ever born	+ 1 child			-.040	.000 <sup>2</sup>	.001 <sup>2</sup>	-.003 <sup>2</sup>	-.006 <sup>2</sup>	-.004 <sup>2</sup>	-.000 <sup>2</sup>	-.002 <sup>2</sup>	-.004 <sup>2</sup>	-.040
7. Employment income of husband	+ 1000 dollars	-.032 <sup>2</sup>	-.061	-.044	-.030	-.019	-.012	-.015	-.011	-.021	-.003 <sup>2</sup>	.008 <sup>2</sup>	-.011 to -.061
8. Asset income of family	+ 1000 dollars	-.127 <sup>2</sup>	-.042	-.036	-.027	-.008 <sup>2</sup>	-.004 <sup>2</sup>	-.015	-.011	-.025	-.021	-.006 <sup>2</sup>	-.011 to -.042
9. Employment income of husband plus asset income of family divided by number of persons in family	+ 250 dollars	.037 <sup>2</sup>	.034	.022	.014	.007	-.001 <sup>2</sup>	.003 <sup>2</sup>	.002 <sup>2</sup>	.006	.002 <sup>2</sup>	-.000 <sup>2</sup>	.006 to .034
10. Age of wife at first marriage	+ 1 year	.119	.021	.008	.002 <sup>2</sup>	-.004 <sup>2</sup>	-.003 <sup>2</sup>	.001 <sup>2</sup>	.004	.002 <sup>2</sup>	.001 <sup>2</sup>	-.002 <sup>2</sup>	.004 to .119
11. Dummy variable set equal to 1 if religion of wife is Roman Catholic, and equal to 0 otherwise	Religion is Roman Catholic	-.025 <sup>2</sup>	.012 <sup>2</sup>	.053	.058	.035 <sup>2</sup>	.027 <sup>2</sup>	-.009 <sup>2</sup>	-.042 <sup>2</sup>	.010 <sup>2</sup>	.010 <sup>2</sup>	.015 <sup>2</sup>	.053 to .058
12. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise	Language of home is French	.046 <sup>2</sup>	-.073	-.110	-.010	-.133	-.107	-.105	-.069	-.115	-.099	-.014 <sup>2</sup>	-.010 to -.133
13. Provincial unemployment rate	+ 1.0%	-.017 <sup>2</sup>	-.009 <sup>2</sup>	-.003 <sup>2</sup>	-.014	-.010	-.012	-.009 <sup>2</sup>	-.009 <sup>2</sup>	-.006 <sup>2</sup>	.003 <sup>2</sup>	-.004 <sup>2</sup>	-.010 to -.014
14. Local opportunity for jobs index	+ 0.1	.116	.077	.062	.056	.068	.083	.087	.079	.079	.038	.018	.018 to .116

<sup>1</sup>Numbers in parentheses are actual proportions of working wives in each age group.

<sup>2</sup>Associated probit coefficients are not significant at a 95% level of confidence.

Source: Probit coefficients used to calculate these changes are shown in Table 2.10.

values of the explanatory variables. Looking only at the changes associated with probit coefficient estimates that were found to be significant with a 95% level of confidence, we see that the most consistent and largest declines in the probability of a wife working are associated with the birth of another child.

Looking at all the expected changes, whether or not the associated coefficient estimates are significant, we can also see that the impact of the variables for the employment income of the husband, the asset income of the family, and the variable capturing the interaction between these two variables and family size all become less as we proceed from the 20-24 age group to the 40-44 age group. The impact of the opportunity for jobs variable becomes less as we proceed from the 15-19 age group to the 30-34 age group, greater as we proceed from the 30-34 age group to the 45-49 age group, and then progressively less again for older age groups. These observed age patterns seem to coincide with the decline with age in the numbers of wives entering the labour force for the first time, and, as wives enter their forties, the increase in the numbers of wives re-entering the labour force after prolonged periods of not working.

In order to get a better picture of the magnitudes of the changes made in constructing Table 2.11 in the explanatory variables relative to the mean values of these explanatory variables for each age group, these means are shown in Table 2.12. In Table 2.12 we also show separate means for wives in each age group who worked and for wives who did not work. Years of education decreases steadily as we move from the 20-24 age group to the 65+ age group. The mean values for all the child-status variables first increase and then decrease with increasing age, except for the mean values for children ever born. The mean values for children ever born increase up to the 40-44 age group, then decrease until the 55-59 age group, and then increase again. The mean values for husband's employment income increase up to the 35-39 age group and then decrease. On the other hand, the mean values for the asset income of the family increase steadily with the age of the wife.

The mean ages at first marriage are not very meaningful for the older age groups. This is because the values of this variable were calculated by subtracting the number of years that have passed since a wife's first marriage from her present age. The number of years since first marriage is given on the Family File of the Public Use Sample in single years of age up to 35 years, and as 35 years for all

TABLE 2.12. Mean Values of Explanatory Variables for All Wives, Wives Who Did Not Work, and Wives Who Worked

Explanatory variables	Age groups										
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
1. Years of education	9.9 <sup>1</sup> 9.4 <sup>2</sup> 10.4 <sup>3</sup>	10.9 10.0 11.4	10.7 9.9 11.5	10.1 9.7 10.6	9.6 9.3 10.1	9.4 9.0 9.9	9.2 8.6 9.8	9.1 8.6 9.8	8.7 8.2 9.7	8.0 7.7 9.2	7.5 7.5 8.9
2. Number of children less than six years of age	0.6 0.8 0.4	0.8 1.3 0.5	1.1 1.4 0.8	0.9 1.1 0.6	0.5 0.6 0.3	0.3 0.3 0.2	0.1 0.1 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0
3. Number of children 6-14 years of age	0.0 0.0 0.0	0.0 0.1 0.0	0.6 0.8 0.4	1.7 1.9 1.5	2.0 2.1 1.8	1.5 1.7 1.2	0.9 1.1 0.6	0.4 0.4 0.3	0.1 0.1 0.1	0.0 0.0 0.0	0.0 0.0 0.0
4. Product of numbers of children less than six and number 6-14 years of age	0.0 0.0 0.0	0.0 0.1 0.0	0.6 0.8 0.3	1.3 1.7 0.7	1.1 1.3 0.6	0.5 0.7 0.3	0.2 0.2 0.1	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0
5. Number of children 19-24 years of age attending school full- or part-time	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.2 0.2 0.2	0.3 0.3 0.3	0.2 0.2 0.2	0.2 0.1 0.2	0.1 0.1 0.1	0.0 0.0 0.0
6. Number of children ever born	0.6 0.8 0.5	0.9 1.4 0.5	1.7 2.2 1.2	2.6 3.0 2.1	3.1 3.3 2.8	3.3 3.6 2.9	3.2 3.5 2.7	3.0 3.3 2.7	2.9 3.0 2.6	3.0 3.1 2.7	3.1 3.1 2.6
7. Employment income of husband	4418.0 4008.3 4766.4	5941.8 6068.2 5874.8	7520.0 7746.7 7277.9	8480.2 8871.4 7896.1	8523.0 8953.9 8253.9	8252.7 8692.0 8290.5	7274.7 8571.3 7961.6	6162.7 7357.2 7148.4	6162.7 6187.7 6113.6	4564.9 4344.0 5313.2	1539.1 1397.7 3108.2
8. Asset income of family	50.5 72.3 32.0	95.9 77.0 106.4	194.2 195.9 192.3	198.6 192.2 208.2	266.3 256.6 282.1	371.5 375.6 365.8	508.6 532.3 476.4	692.6 698.6 683.1	973.0 1000.9 915.7	1450.7 1516.3 1228.1	1712.2 1729.6 1519.4
9. Employment income of husband plus asset income of family divided by number of persons in family	1818.5 1510.6 2080.4	2322.0 1929.0 2540.4	2345.0 2058.3 2657.6	2096.2 2012.5 2222.4	2010.6 1973.3 2071.3	2080.5 2008.8 2181.6	2463.6 2368.2 2546.0	2653.9 2614.0 2717.6	2836.6 2820.0 2870.7	2705.0 2629.5 2960.7	1532.9 1475.8 2166.5
10. Age of wife at first marriage	17.7 17.4 18.0	20.2 19.5 20.6	21.4 20.8 22.1	21.8 21.5 22.2	22.3 22.5 22.1	23.0 23.1 22.8	23.7 23.6 23.7	24.6 24.3 25.1	26.0 25.9 26.4	29.1 29.0 29.4	36.2 36.3 35.7
11. Dummy variable set equal to 1 if religion of wife is Roman Catholic, and equal to 0 otherwise	0.40 0.41 0.39	0.44 0.47 0.43	0.48 0.51 0.45	0.48 0.50 0.45	0.46 0.50 0.40	0.46 0.51 0.40	0.41 0.48 0.33	0.39 0.44 0.30	0.37 0.41 0.29	0.39 0.41 0.31	0.33 0.33 0.29
12. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise	0.16 0.16 0.16	0.23 0.27 0.22	0.27 0.31 0.23	0.26 0.29 0.20	0.25 0.30 0.15	0.25 0.31 0.16	0.23 0.30 0.14	0.23 0.28 0.14	0.22 0.27 0.13	0.23 0.26 0.14	0.21 0.21 0.14
13. Provincial unemployment rate	5.7 6.0 5.5	5.9 6.1 5.7	6.0 6.2 5.8	6.0 6.1 5.7	5.9 6.1 5.6	5.9 6.2 5.6	5.9 6.1 5.5	5.9 6.1 5.6	5.9 6.1 5.6	5.9 6.0 5.7	5.8 5.9 5.5
14. Local opportunity for jobs index	0.41 0.38 0.43	0.42 0.39 0.43	0.41 0.40 0.43	0.41 0.40 0.42	0.41 0.39 0.43	0.41 0.39 0.43	0.41 0.39 0.43	0.40 0.39 0.43	0.40 0.39 0.42	0.40 0.39 0.42	0.40 0.40 0.42

<sup>1</sup>Mean value for all wives in this age group.<sup>2</sup>Mean value for wives in this age group who did not work.<sup>3</sup>Mean value for wives in this age group who worked.

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Family File.

those whose actual date of first marriage was more than 35 years ago. The proportions of wives who are Roman Catholic, and the proportions of wives living in homes where the head has stated that French is the language most often spoken at home, rise up to the 25-29 and 30-34 age groups, and then decline steadily with the exception of the 60-64 age group. Neither the mean unemployment rates nor the mean values for the opportunity for jobs index indicate any clear pattern with age.

Looking now at the mean values for those who did not work versus the mean values for those who worked, we find that the wives who worked are more educated, have fewer children younger than six, fewer children 6-14 years of age, and fewer children ever born, but as many or more children 19-24 years of age attending school full- or part-time, generally live in households where the husband's employment income and the family asset income are lower, but the per person family income (ignoring the income of the wife) is higher, tended to marry later, are less likely to be Roman Catholic or live in a French-speaking home, and live in places where the unemployment rates are lower and the values of our opportunity for jobs index are higher.

In this chapter we have focused on the question of which wives work for pay. But, of course, there are wives who want to work, but cannot find work immediately at a wage rate that is acceptable to them. These unemployed wives are the focus of our next chapter.

# FOOTNOTES

<sup>1</sup>Employment income includes income from wages and salaries, net income from business or professional practice and/or net farm income.

<sup>2</sup>In a study such as Heckman's (1976) which includes no market variables, the demand for the labour of married women in any given education-experience (and hence offered wage) class is implicitly assumed to be infinitely elastic. Thus the observed differences in the labour force behaviour of individual women are attributed entirely to differences in personal and family characteristics such as education and child status.

The studies of the labour force participation of Canadian wives by Ostry (1968), Spencer and Featherstone (1970), Skoulas (1974) and Gunderson (1976, 1977) all include both a place of residence variable and a region variable, and the study by Allingham and Spencer (1968) includes a place of residence variable. Since many aspects of the Canadian economy, including the industrial and occupational structure and the general unemployment rate, differ systematically by place of residence and region, it is not surprising that the labour force behaviour of wives also differs systematically from one place of residence and region to another. Place of residence and regional variables cannot provide much insight into the reasons for these observed differences, however.

<sup>3</sup>Our variable for the education of the wife is really an index for the level of schooling. Values were assigned to this index as follows:

<u>Level of schooling of wife</u>	<u>Index value</u>
No schooling	0.0
Below Grade 5	2.5
Grades 5-8	6.5
Grades 9-10	9.5
Grade 11	11.0
Grade 12	12.0
Grade 13	13.0
University 1-2	14.5
University 3-4 without degree	16.0
University 3-4 with degree	17.0
University 5+ without degree	18.0
University 5+ with degree	19.0

A more sophisticated scheme for assigning values to this educational index would undoubtedly change the magnitudes of the associated coefficients somewhat, but would not alter our basic findings.

<sup>4</sup>The child-status variables included in the Family File of the Public Use Sample are the number of children in the family less than six years of age, the number 6-14 years, the number 15-18 years attending school, the number 15-18 not attending school, the number 19-24 attending school, and the number 19-24 not attending school.

<sup>5</sup>The age at first marriage variable was created by subtracting the number of years that have passed since a wife's first marriage from her age at the time the 1971 Census was taken on 1 June 1971.

<sup>6</sup>A variable is included in the Family File of the Public Use Sample for whether the wife last worked in 1971, in 1970, before 1970 or never worked. Thus, for a wife with employment income in 1970, there is no information on whether she worked prior to 1970. This information is only available for those who did not work in either 1970 or 1971.

<sup>7</sup>The unemployed include all those who looked for work or were on temporary layoff in the week prior to enumeration. The unemployment rate is the ratio between the number of persons unemployed and the number of persons in the labour force in the given week.

<sup>8</sup>The finding that women are occupationally segregated is not new. See Ostry (1967) and Gunderson (1976) for Canadian studies; Gross (1968), Oppenheimer (1970), Ferris (1971), Bergmann and Adelman (1973) and Fuchs (1974) for studies of occupational segregation by sex in the United States.

<sup>9</sup>Although Statistics Canada has published more fully corrected industrial data by sex and marital status, these corrections have not been extended to variables such as weeks worked and income. In later chapters of this monograph we make comparisons over time between other variables such as these. Hence we have chosen to use our data at this point to ensure consistency with these later data. Appendix A compares our partially corrected data with those corrected by Statistics Canada.

In all three years, the data pertain to all persons in the current labour force except those seeking work who have never worked, and, additionally, the 1971 data exclude those persons who last worked before 1 January 1970.

<sup>10</sup> This does not mean, of course, that the relative wages of women compared with the wages of men have risen over this period (see Meltz, 1965, pp. 61-68).

<sup>11</sup> In the Public Use Sample some of the 23 major occupational groups for the 1971 Census have been combined to create 18 occupational groups on the Individual File and 15 occupational groups on the Family File. Thus, in order to retain a maximum amount of occupational information we have used the Individual File whenever possible in calculating occupational characteristics for wage earners in 1970, and for the 1971 labour force, which cannot be computed from the information published by Statistics Canada from the 1971 Census. Occupational characteristics are presented in our monograph using the categories for the Individual File.

<sup>12</sup> Statistics Canada has published historical data using the 1961 classification (a 1971 sample was recoded on this basis) which also show that occupational segregation is not decreasing. Other data showing persistent segregation are presented in Appendix A.

<sup>13</sup> There appears to have been an over-enumeration of unpaid family workers in 1971. Since approximately two-thirds of the women in the agriculture industrial and occupational groups are in this category, some of the increase in these groups is probably due to these enumeration problems.

<sup>14</sup> For 1951, 1961 and 1971 the chi-square statistics for the tests comparing the industrial distributions of married and non-married women, given the distributions of all women, are all less than the 0.99 two-tailed critical value for a chi-square distribution with 11 degrees of freedom. On the other hand, the chi-square statistic for the test comparing the growth in the married and non-married female labour forces, given the growth in the total female labour force, is greater than the 0.10 two-tailed critical value for a chi-square distribution with 11 degrees of freedom.

<sup>15</sup> For 1951, 1961 and 1971 the chi-square statistics for the tests comparing the occupational distributions of married and non-married women, given the

distributions of all women, are all less than the 0.99 two-tailed critical value for a chi-square distribution with 17 degrees of freedom. On the other hand, the chi-square statistic for the test comparing the growth in married and non-married women workers, given the growth in all women workers, is greater than the 0.10 two-tailed critical value for a chi-square distribution with 17 degrees of freedom.

<sup>16</sup>The values of our local opportunity for jobs index were computed from the Individual File of the Public Use Sample using those women and men at least 15 years of age who reported both an industry and an occupation, and who had positive income from wages and salaries in the calendar year of 1970.

Subsequent to developing our local opportunity for jobs index we found that Bowen and Finegan (1969, pp. 772-776) had calculated a similar index for the U.S. which differs from ours in that the denominator of their index for each geographical region is the total civilian employment, rather than the potential female labour force as in the case of our index. For purposes of examining the wage rates and labour force behaviour of married women we feel that our index is more appropriate, although use of either index probably would represent an improvement on the common practice in cross-sectional studies of ignoring labour market conditions.

<sup>17</sup>The annual average unemployment rates for 1970 used in this study are 10.8% for Newfoundland, 5.7% for Nova Scotia, 8.0% for New Brunswick, 7.9% for Quebec, 4.3% for Ontario, 4.5% for Manitoba, 4.3% for Saskatchewan, 4.3% for Alberta and 7.6% for British Columbia (see Bank of Canada Review, December 1971, p.597, Table 53).

<sup>18</sup>A good introduction to the use and interpretation of dummy variables can be found in Wonnacott and Wonnacott (1972, pp. 308-313). A more extensive but still elementary discussion can be found in Pindyck and Rubinfeld (1976, pp. 77-82).

<sup>19</sup>On the Family File of the Public Use Sample, the actual values for the employment income of the husband during the calendar year of 1970 are given for incomes up to and including \$49,999. Incomes of \$50,000 or more are all given as \$50,000. Also, to preserve the confidentiality of census data, the records for families (with male heads) with actual total family incomes of \$100,000 or more were dropped from the Family File. The employment income of the head includes income

from wages and salaries, net income from business or professional practice and net farm income.

<sup>20</sup>What we refer to here as the asset income of the family actually includes bond and deposit interest and dividends; other investment income; retirement pensions from previous employment; and all income received by the family during 1970 on a regular basis not included in the categories of family employment income, family income from family and youth allowances, family income from federal and provincial government pension plans, or other government transfer payments. Examples of types of income that would fall into this last residual category are alimony, net income from roomers and boarders, pensions received from abroad, strike pay, royalties and so forth. Actual values for our family asset income variable are given in the Family File for figures up to and including \$29,999. All figures in excess of \$29,999 are given in the Family File as \$30,000.

A careful examination of the material presented in this chapter will reveal that employment income received by family members other than the husband or wife, income from family and youth allowances, income from federal and provincial government pension plans, and other government transfer payments have not been included in our analyses. From the data available on the Family File of the Public Use Sample, it is possible to construct a separate variable for each of these omitted income sources. However, the variable for income from family and youth allowances is highly collinear with our child-status variables. Preliminary estimation results revealed that the coefficients of the remaining income variables are generally insignificant, particularly for the younger age groups. This is probably due to the way in which our sample was selected. For instance, we have excluded all single-parent families. Our decision, therefore, was to drop these four income variables from our analyses. To the extent that these omitted income variables do, in fact, affect the labour force behaviour of Canadian wives, these variables are in the error terms of the relationships we have estimated, and may be responsible for biases in some of our coefficient estimates.

<sup>21</sup>Gunderson (1977) avoids the problems inherent in assuming a linear relationship by applying logit analysis to micro data on married women from the 1971 Census cross-tabulated by age (15-24, 25-34, 35-44, 45-64), education (incomplete high school, complete high school, complete university), child status (no children, pre-school children only, school children only, both pre-school and school children),

family income minus labour market earnings of wife (less than \$3,000; \$3,000-\$5,999; \$6,000-\$8,999; \$9,000-\$11,999; \$12,000-\$14,999; \$15,000+), place of residence (urban, rural non-farm) and husband's employment status (employed, unemployed). In using data for these cells, however, rather than the records for the individual women, Gunderson is ignoring the within-cell variation.

See also Davis (1969) for a discussion of the use of logit and probit analysis in analysing labour force participation.

<sup>22</sup> See Section 1.1.

<sup>23</sup> See Pindyck and Rubinfeld (1976, pp. 238-254) for an introduction to probit analysis and a brief discussion of how probit analysis is related to other techniques commonly used for estimating models of binary choice.

<sup>24</sup> A cumulative probability table for the standard normal distribution is given, for instance, in Wonnacott and Wonnacott (1972, p. 590).

<sup>25</sup> In general, a child-status variable was excluded from our analysis for a particular age group if its mean value for wives in that age group was zero to one significant decimal place. The exception to this rule is our variable for the number of children 19-24 years of age attending school full- or part-time. This variable was included in our equations for the age groups 30-34, 35-39 and 65+ despite the fact that the mean values of this variable for these age groups are all zero to one significant decimal place (see Table 2.12). Also, the variable for the number of children ever born was excluded for the age group 15-19 because it is essentially equal (for individual wives) to the number of children less than six years of age, and for the age group 20-24 because it is essentially equal to the sum of the number of children younger than six and the number 6-14 years of age.

<sup>26</sup> This result is not believed to be due to multicollinearity between the dummy variable for the wife's religion and the dummy variable set equal to one if the language of the home is French. For the eleven age groups the correlations between these two variables are 0.51, 0.56, 0.58, 0.59, 0.59, 0.64, 0.65, 0.67 and 0.70 respectively. However, it is possible that both these dummy variables are partially accounting for non-linearities in the actual relationships between the indices, from which the probabilities of working are computed, and some of the included explanatory variables such as the child-status variables.

## CHAPTER 3

### WHICH WIVES ARE UNEMPLOYED?

#### 3.1. Introduction

If a wife is looking for work because she believes it is possible to find work at an offered wage rate exceeding her asking wage and has not yet found such a job, then she is unemployed.<sup>1</sup> Unemployed wives fall into at least four categories. First, there are the wives entering the labour market for the first time, or re-entering after having dropped out for varying periods of time for personal reasons. Some of these wives will be entering the labour force as a result of changes in their personal circumstances, such as a youngest child starting school. Others will be entering in response to improved economic conditions leading to higher wage expectations. These wives with little or no recent work experience may not begin their job searches with accurate perceptions of their earning capabilities.

Second, there are wives who look for short-term work on a continuing or seasonal basis, and accept jobs from time to time depending on their immediate personal situations and the desirability of the job offers received. These wives may also be holding out for offered wage rates that are relatively high given their qualifications and their requirements for working conditions and type of job. Third, there are the wives who have been laid off. These women should have fairly accurate perceptions of their potential offered wage rates. However, the process of finding a new job still may take time. Also these women are often concentrated in areas with high levels of unemployment due to area-wide economic slowdowns. Hence it may be impossible for some of these wives who have lost their jobs to find new ones that pay as well as their old jobs did. Finally, there are the wives who have voluntarily left their old jobs because they feel it may be possible to find better paying positions. Job hunters of this type are likely to be more numerous in areas where the economic conditions are good and jobs for women are relatively plentiful.

Table 3.1 shows the 1971 age distribution of all employed women, and unemployed women both with and without previous work experience. It is interesting

See footnote(s) on page 87.

TABLE 3.1. Age Distributions for All Women for 1951 and 1971, and for Women by Current Labour Force Status and Previous Work Experience, Canada,<sup>1</sup> 1971

Item	Age groups						
	15-19	20-24	25-34	35-44	45-54	55-64	65+
Total women							
1951	10.9	11.4	22.9	19.0	14.0	10.7	11.1
1971	13.6	12.4	18.7	16.2	15.1	11.5	12.6
Unemployed women	33.7	21.2	16.1	11.3	10.0	5.8	1.9
Without recent work experience <sup>2</sup>	55.5	13.5	10.7	8.0	6.5	3.8	1.9
Without recent work experience and not attending school	19.7	16.5	21.1	<sup>3</sup>	<sup>3</sup>	<sup>3</sup>	<sup>3</sup>
With recent work experience	22.5	25.1	18.9	12.9	11.8	6.8	2.0
Employed women	10.5	19.2	21.3	18.5	17.5	10.3	2.7
All women not currently in the labour force	14.2	7.6	17.2	15.2	14.0	12.5	19.5
With work experience since 1 January 1970	16.6	18.8	23.0	14.6	12.1	8.6	6.3
With work experience prior to 1 Jan. 1970	1.4	6.4	22.0	18.6	15.4	13.3	22.8
Women with work experience since 1 January 1970 who are not currently working <sup>4</sup>	17.7	20.0	22.2	14.3	12.1	8.3	5.2
Women with previous work experience who are not currently working <sup>5</sup>	6.6	10.8	22.1	17.2	14.4	11.7	17.3

<sup>1</sup>Data include the Yukon and Northwest Territories.

<sup>2</sup>Recent work experience is work experience since 1 January 1970.

<sup>3</sup>The published data do not distinguish between those attending and not attending school in these age groups.

<sup>4</sup>This includes both the unemployed and women not in the current labour force.

<sup>5</sup>This includes the unemployed with experience since 1 January 1970, plus those not in the labour force who have experience either before or after 1 January 1970. It does not include the unemployed with experience before 1 January 1970.

Source: Calculated from 1951 Census of Canada, Vol. II, Table 1; and 1971 Census of Canada, Vol. I - Part 4, Table 1; and Vol. III - Part 7, Table 1.

to note that 54.9% of all unemployed women, 47.6% of all unemployed women with recent (since 1 January, 1970) work experience, and 69.0% of all unemployed women without recent work experience are under 25 years of age. These figures would seem to suggest that unemployment is predominantly a problem of young women.

Moreover, since 85% of all unemployed women 15-19 without any recent work experience and 47% of all unemployed women 20-24 without any recent work experience are still attending school,<sup>2</sup> the unemployment problem in these younger age groups would appear to be largely one of entry into part-time jobs while still attending school, and into jobs of a more permanent nature following the completion of school. Of those women seeking a first permanent job following the completion of their formal schooling, a large proportion will clearly have had some previous part-time job experience and hence will be classed as part of the experienced labour force. The financial and other circumstances surrounding their unemployment will be very different, however, from the circumstances of older women who have become unemployed due to layoffs. The labour force entry problem of the young has undoubtedly become more severe because of the relatively large numbers in the 15-19 and 20-24 age groups in 1971 compared with the situation in 1951.

Table 3.2 shows that between 83.7% and 85.3% of all the unemployed and between 72.8% and 77.3% of all unemployed women in the period 1951-71 had had previous work experience. As already pointed out, of course, some of this experience may have been in part-time jobs held by young people still attending school. Table 3.2 also shows the percentages of women among all the unemployed, among all the unemployed with previous work experience, and among all the unemployed without previous work experience in 1951, 1961 and 1971. It is clear that the percentage of women in each of these categories rose sharply between 1961-71. Thus it would appear that unemployed women are becoming a more prominent part of all aspects of the over-all unemployment problem although part of this apparent rise in the incidence of unemployment among women may be due to measurement problems.<sup>3</sup>

Unemployment by its very nature is transitory. That is, most of the unemployed eventually find work, or cease to look for work. By definition, the unemployed do not include those who have given up looking for work. Those who are included in the unemployed category will also have widely differing experiences in

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See footnote(s) on page 87.

TABLE 3.2. Characteristics of Persons Looking for Work, Canada,<sup>1</sup> 1951, 1961 and 1971

Category	Year		
	1951 <sup>2</sup>	1961	1971 <sup>2</sup>
Persons with previous experience as percentage of those looking for work:			
Total	85.3	84.7	83.7
Women	75.9	72.8	77.3
Women as percentage of those looking for work:			
Total	20.4	20.9	38.6
With previous experience	18.2	17.9	35.7
Never worked	33.4	37.0	53.9

<sup>1</sup>1951 data exclude the Yukon and Northwest Territories.

<sup>2</sup>Persons on temporary layoff are excluded in 1951 and 1971.

Source: Calculated from 1951 Census of Canada, Vol. V, Table 10; 1961 Census of Canada, Vol. III - Part 3, Table 37; and 1971 Census of Canada, Vol. III - Part 7, Table 13.

terms of the duration of unemployment. Among those who are unemployed during some particular time period, there will be those whose unemployment has lasted no longer than this reference period and others whose unemployment may have stretched over a period many times this long.

In most of our analyses the unit time period has been, and will be, one year. This time unit was selected because the 1971 Census of Canada contains information on both the number of weeks worked and employment income for the calendar year 1970. However, a year is not an ideal unit of time for studying the phenomenon of unemployment. An examination of monthly labour force data reveals that, over the period 1951-71, those workers unemployed continuously for six months or more have always comprised less than 20% of the total number of persons unemployed in the survey month.<sup>4</sup> The percentage of persons unemployed continuously for a whole year is clearly smaller.

In fact, no information is available in the 1971 Census that would allow us to differentiate those who were unemployed for the whole of 1970 from those who did not work any weeks or earn any employment income during 1970 because they were not in the labour force. Rather the information contained in the 1971 Census on labour force status relates to the census enumeration week, which for most will be the week prior to 1 June 1971.

Thus all analyses in this chapter pertain to the labour force status (that is employed, unemployed or not in the labour force) of persons in the enumeration periods for each of the relevant Canadian censuses.<sup>5</sup>

One final point should be brought out concerning the relationship between the analyses in this chapter and those in Chapters 2 and 4. Certain aspects of the problem of underemployment have already been treated implicitly as part of our analyses of the determinants of a wife's offered wage rate. Moreover, we will argue in Chapter 4 that wives adjust their hours of work in an attempt to equate their offered and asking wage rates. When the structure of the economy is such that there are few job opportunities available for women, or when economic conditions are poor, offered wage rates will be low. Thus, if other factors such as husband's

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See footnote(s) on page 87.

income remain unchanged, fewer wives will choose to work.<sup>6</sup> Moreover, the fact that many of these wives might like to work, if suitable work at a higher wage rate could be found, will not show up in unemployment statistics.

In Section 3.2 we will study the industrial and occupational characteristics of unemployed women, and the patterns of change in industrial and occupational unemployment rates over time. The analyses in this section will be limited to the unemployed with recent (since 1 January 1970) job experience, since industrial and occupational data are not available for those entering the labour force for the first time or with no recent work experience. Then in Section 3.3 we will study the personal and regional economic conditions and the responses to these conditions that distinguish unemployed wives from both those wives who worked for pay or profit and those not in the market labour force.<sup>7</sup> All unemployed wives including those seeking work for the first time and those with no recent job experience are included in these analyses.

### 3.2. The Industrial and Occupational Characteristics of Unemployed Women with Recent Job Experience

Systematic differences in unemployment rates among different industries and occupations can arise from at least three groups of factors. First, demand conditions may differ for the products of different industries at any one point in time, and for the products of any one industry over time. Since particular occupations tend to be concentrated in certain groups of industries, the impact of uneven demand patterns for the goods and services of particular industries will also affect some occupations more strongly than others. Second, automation and technological change tend to strengthen the demand for workers in certain occupations and weaken demand in others. Finally, different industries and occupations tend to collect workers of different types. Workers with little training or who are working part-time may be more likely to drop in and out of the labour force for personal reasons, and hence may experience more frictional unemployment. Also employers are believed to be more likely to resort to layoffs as opposed to other methods for cutting back in the case of these workers.

Table 3.3 shows unemployment rates by industry (using our corrected data as noted in Appendix A) for both the total labour force and women in 1951, 1961 and

See footnote(s) on page 87.

TABLE 3.3. Percentage Unemployed and Women as Percentage of Unemployed by Industry, Canada,<sup>1</sup> 1951, 1961 and 1971

Industry	Percentage unemployed <sup>2</sup>						Women as percentage of total unemployed		
	Total			Women			total unemployed		
	1951	1961	1971	1951	1961	1971	1951	1961	1971
Agriculture	0.2	0.9	2.0	0.2	0.6	2.3	3.7	8.6	26.8
Forestry	3.0	14.9	16.1	0.8	8.2	8.3	0.5	1.1	2.3
Fishing and Trapping	2.1	5.3	6.2	0.7	2.9	8.3	0.3	0.8	4.8
Mining	1.0	4.1	6.4	0.3	2.8	6.6	0.7	2.8	6.9
Manufacturing <sup>3</sup>	0.8	3.3	6.7	0.8	3.1	9.0	19.2	20.4	32.2
Construction	2.0	8.6	10.1	0.7	3.1	7.3	0.6	0.9	3.6
Transportation	0.8	3.3	4.9	0.3	1.9	5.7	4.6	7.9	19.8
Trade <sup>3</sup>	0.7	2.9	6.0	0.6	2.7	7.4	25.9	28.7	45.6
Finance <sup>3</sup>	0.3	1.4	4.0	0.2	1.6	5.1	35.0	52.3	65.5
Community-Personal Service <sup>3</sup>	0.7	2.1	5.1	0.6	1.8	5.1	47.5	48.8	56.6
Public Administration	0.5	2.3	3.6	0.3	1.4	3.9	10.8	10.8	27.9
Unspecified	52.7	6.8	8.5	58.2	4.3	6.9	21.3	16.7	35.9
All industries	1.5	3.3	5.9	1.2	2.2	6.1	18.2	17.9	35.2

<sup>1</sup>The 1961 and 1971 figures include the Yukon and Northwest Territories; the 1951 figures do not.

<sup>2</sup>In 1951 and 1961, the unemployed are all those persons seeking work who have had any previous work experience. In 1971, the unemployed classification excludes those who last worked prior to 1 January 1970. Those who have never worked are excluded in all cases. Persons on temporary layoff are excluded in 1951 but are included in 1961 (at least in theory) and in 1971.

<sup>3</sup>More than 5% of the female labour force was in this industry in 1951, 1961 and 1971 (see Table 2.2).  
Source: Calculated from 1951 Census of Canada, Vol. IV, Table 16; Vol. V, Table 11; 1961 Census of Canada, Vol. III - Part 2, Table 1A; Vol. III - Part 3, Table 39; and 1971 Census of Canada, Vol. III - Part 4, Table 2; Vol. III - Part 7, Table 25.

1971. Notice that in 1951 and 1961 these unemployment rates were higher for the total labour force than for women for all industries except the Unspecified category in 1951 and Finance in 1961. However, by 1971 the unemployment rates were higher for women in all industries except Forestry, Construction and Unspecified. The reasons for this transition are far from clear.

As noted in Section 3.1, the observed rise in the unemployment rates for women based on 1971 Census data compared with 1961 and 1951 Census data may partially reflect measurement problems, including changes in the questions asked in the various censuses and the use of self-enumeration in 1971.<sup>8</sup> Even if the so-called "transition" from relatively low to relatively high unemployment rates for women is entirely a measurement illusion, we are still left with the task of trying to explain the relatively high 1971 rates. Moreover, it seems likely that at least some portion of the observed transition in female unemployment rates is attributable to a variety of real changes in female labour market conditions, although there is no way of determining exactly what this proportion is.

Looking at Table 3.4, we see that the percentage growth in the female labour force from 1951-71 has been greater than for the labour force as a whole for every industry. Thus, in part, the high unemployment rates for women in 1971 may reflect high levels of frictional unemployment, with relatively large numbers of women with some recent job experience searching for better positions, or re-entering the labour force after periods of withdrawal, in response to expanding job opportunities for women. Second, as we will show in Chapter 4, there have been increases in the percentages of part-time wage earners among both women and all wage earners. Moreover, by 1970 approximately two-thirds of all those who worked less than 35 hours per week and nearly half of those who worked less than 40 weeks per year were women. This over-representation of part-time wage earners<sup>9</sup> in the female labour force could well have contributed to the 1971 phenomenon of higher unemployment rates for women relative to the labour force as a whole.

The first two columns of Table 3.5 show the unemployment rates by industry for women and men who usually worked less than 35 hours per week, versus the rates for those who worked 35 hours or more per week.<sup>10</sup> For men in all industries the

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See footnote(s) on page 87.

TABLE 3.4. Changes in Unemployment by Industry, Canada,<sup>1</sup> 1951-71

Industry	Percentage growth in labour force 1951-71		Percentage distribution of total unemployed <sup>2</sup>			Percentage distribution of unemployed women		
	Total	Women	1951	1961	1971	1951	1961	1971
Agriculture	-41.8	217.9	2.3	2.7	1.9	0.5	1.3	1.4
Forestry	-42.8	42.7	4.9	7.6	2.4	0.1	0.5	0.2
Fishing and Trapping	-50.5	121.0	1.4	0.9	0.3	0.0	0.0	0.0
Mining	31.6	296.3	1.3	2.3	1.8	0.0	0.4	0.3
Manufacturing <sup>3</sup>	25.4	47.2	14.6	21.8	22.3	15.4	24.8	20.4
Construction	53.1	336.6	9.2	17.5	10.6	0.3	0.9	1.1
Transportation	44.0	110.0	5.0	9.3	6.4	1.3	4.1	3.6
Trade <sup>3</sup>	78.6	120.0	6.6	13.3	14.9	9.4	21.3	19.3
Finance <sup>3</sup>	148.4	187.7	0.5	1.5	2.8	1.0	4.3	5.2
Community-Personal Service <sup>3</sup>	163.5	162.8	6.7	12.7	20.6	17.6	34.6	33.1
Public Administration	109.1	200.7	1.8	5.2	4.5	1.1	3.2	3.6
Unspecified	905.4	2208.1	45.6	5.1	11.4	53.3	4.8	11.7
All industries	62.8	153.8	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1</sup>The 1961 and 1971 figures include the Yukon and Northwest Territories; the 1951 and growth figures do not.

<sup>2</sup>See footnote 2, Table 3.3.

<sup>3</sup>More than 5% of the female labour force was in this industry in 1951, 1961 and 1971 (see Table 2.2).

Source: Calculated from 1951 Census of Canada, Vol. IV, Table 16; Vol. V, Table 11; 1961 Census of Canada, Vol. III - Part 2, Table 1A; Vol. III - Part 3, Table 39; 1971 Census of Canada, Vol. III - Part 4, Table 2; and Vol. III - Part 7, Table 25.

TABLE 3.5. Unemployment Rates for Labour Force<sup>1</sup> in the Week Prior to Enumeration for the 1971 Census, by Work Status, Sex and Industry, Canada

Industry and sex		Work Status					
		Usually worked less than 35 hours per week	Usually worked 35 hours per week or more	Worked less than 40 weeks in 1970	Worked 40 weeks or more in 1970	Usually worked less than 35 hours per week and less than 40 weeks in 1970	Usually worked more than 35 hours per week and more than 40 weeks in 1970
Agriculture	F	2.9	2.3	5.5	0.3	5.1	0.4
	M	3.5	1.5	5.9	0.4	4.5	0.4
Forestry	F	(12.5) <sup>2</sup>	12.9	(20.0)	(5.3)	- <sup>3</sup>	(7.1)
	M	20.9	18.5	28.8	7.6	28.1	7.8
Fishing and Trapping	F	-	(0.0)	-	-	-	-
	M	(6.7)	4.8	5.0	5.2	(8.0)	5.7
Mining	F	(10.0)	3.3	10.7	(1.4)	-	0.0
	M	(7.7)	6.5	19.9	2.7	(11.1)	2.8
Manufacturing	F	11.2	8.4	18.3	4.1	17.8	4.2
	M	13.5	5.8	18.7	3.0	21.1	3.0
Construction	F	2.4	10.3	10.5	6.1	5.6	8.7
	M	16.1	9.2	17.7	4.3	18.6	4.1
Transportation	F	3.8	4.3	11.4	1.7	5.6	1.6
	M	12.7	4.1	19.1	1.4	24.8	1.4
Trade	F	6.8	7.1	12.1	3.9	9.8	4.1
	M	10.9	4.4	15.5	2.2	15.3	2.1
Finance	F	6.3	4.9	12.3	2.3	10.6	2.1
	M	2.7	2.4	12.4	1.1	7.7	1.1
Community-Personal Service	F	5.8	5.2	10.2	2.5	8.6	2.5
	M	9.5	4.1	14.2	1.9	15.1	1.7
Public Administration	F	3.8	3.9	9.3	1.2	6.2	1.3
	M	6.9	3.2	16.3	1.0	15.4	1.0
Unspecified	F	7.8	6.3	10.4	3.7	9.7	3.4
	M	10.7	9.6	19.1	4.4	14.0	4.3
All industries	F	6.2	5.9	11.5	2.9	9.2	2.9
	M	9.9	5.3	16.5	2.3	15.0	2.3

F = Female

M = Male

<sup>1</sup> This table includes only those who were in the labour force in the week prior to 1 June 1971 and who also worked in 1970. The data exclude Prince Edward Island, the Yukon and Northwest Territories.

<sup>2</sup> Thirty or less persons in categories for which figures are in parentheses.

<sup>3</sup> Five or less persons in categories for which dash is given.

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Individual File.

unemployment rates are higher for those who usually worked less than 35 hours per week than for those who usually worked 35 hours per week or more. This is also true for women, with the exception of the Forestry, Construction, Transportation, Trade, and Public Administration industries where women who worked part-time hours actually enjoyed somewhat lower unemployment rates than those who worked full-time hours. It can also be seen that the part-time hours unemployment rates are higher for men than for women for all industries except Mining and Finance. On the other hand, for those who worked 35 hours per week or more the unemployment rates are lower for men than for women for all industries except Forestry, Fishing and Trapping, Mining, and Unspecified. Note that, with the exception of the unspecified industries, these are all industries employing very small numbers of women.<sup>11</sup>

A similar picture emerges from Columns 3 and 4 of Table 3.5. We find that the unemployment rates are higher for those who worked less than 40 weeks in 1970 than for those who worked 40 weeks or more, for both men and women in all industries except the Fishing and Trapping industry for men. In general the differences between the rates for those who worked part-time weeks versus the rates for those who worked full-time weeks are even larger than the differences between the rates for those who worked part-time hours versus the rates for those who worked full-time hours. We find too that for those who worked part-time weeks the unemployment rates are higher for men than for women for all industries, while for those who worked 40 weeks or more in 1970 the unemployment rates are lower for men than for women for all industries except Agriculture, Forestry, Mining, and Unspecified.

Columns 5 and 6 of Table 3.5 show the unemployment rates by industry for those who worked less than 35 hours per week and less than 40 weeks in 1970, and for those who usually worked 35 hours per week or more and 40 weeks or more in 1970, respectively. Comparing the rates in Column 5 with the rates in Column 3 for all those who worked less than 40 weeks (including those who usually worked 35 hours per week or more), we find that the unemployment rates in Column 5 are lower for all industries for women and for all industries except Fishing and Trapping, Manufacturing, Construction, and Transportation for men. This suggests that those who worked less than 40 weeks in 1970 were more likely to be unemployed as opposed to simply out of the labour force if they usually worked more than 35 hours per week.

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See footnote(s) on page 87.

This inference is further substantiated by comparing the rates shown in Column 6 of Table 3.5 with those shown in Column 4 for all those who worked 40 weeks or more in 1970, including those who usually worked less than 35 hours a week. We find that the rates shown in Column 6 are the same or higher than those shown in Column 4 for both women and men for all industries except Mining, Transportation, Finance, and Unspecified for women, and Construction, Trade, Community-Personal Service, and Unspecified for men. Looking just at Columns 5 and 6 now, we again find that part-time men generally have higher unemployment rates than part-time women, while for full-time workers this relationship is reversed.

Looking back at Table 2.2 in Chapter 2 we see that 51.5%, 57.7% and 55.2% of the female labour force in 1951, 1961 and 1971 respectively was in the Agriculture, Finance, Community-Personal Service, and Public Administration industries where unemployment rates can be seen from Tables 3.3 and 3.5 to have been relatively low for both women and the labour force as a whole. The corresponding distributional figures for the total labour force are 38.7%, 40.3% and 40.9%. Thus the unemployment picture for women over the period 1951-71 would probably not have been any brighter if the female labour force had been industrially distributed in the same way as the total labour force was distributed.

The last six columns of Table 3.4 show the outcome of the interaction between unemployment rates by industry and the distributions of unemployed women and all the unemployed over industries. From this table we see that the largest percentages of unemployed women in 1951, 1961 and 1971 were in the Manufacturing, Trade, and Community-Personal Service industries, while the largest percentages of all unemployed were found in the Manufacturing, Construction, Trade and Community-Personal Service industries. Thus, government measures taken to stimulate the Manufacturing, Trade, or Community-Personal Service industries over the period 1951-71 would presumably have helped to lessen unemployment among both women and men, while stimulative efforts directed primarily at the Construction industry, such as incentives to families to buy homes, could not have been expected to have any substantial direct impact on the incidence of unemployment among women. Stimulation of the Construction industry might have secondary effects on other sectors of the economy, however, which would lead to changes in the unemployment rate for women.

Unemployment by occupation shows similar patterns (see Table 3.6). Ignoring the Unspecified category, again we see that in 1951 and 1961 unemployment rates were

TABLE 3.6. Percentage Unemployed and Women as Percentage of Unemployed by Occupation, Canada,<sup>1</sup> 1951, 1961 and 1971

Occupation	Percentage unemployed <sup>2</sup>						Women as percentage of total unemployed		
	Total			Women					
	1951	1961	1971	1951	1961	1971	1951	1961	1971
Managerial	0.2	0.7	1.5	0.1	0.6	2.9	4.8	9.8	29.6
Natural Sciences, Engineering	0.3	1.3	3.5	0.5	2.0	5.4	10.9	7.2	11.4
Social Sciences	0.2	1.1	4.8	0.2	1.5	6.9	30.4	43.1	52.9
Religion	0.1	0.2	1.0	0.0	0.1	3.8	25.0	22.2	59.6
Teaching <sup>3</sup>	0.1	0.4	1.8	0.1	0.3	1.7	50.0	62.0	57.5
Medicine and Health <sup>3</sup>	0.4	0.9	2.4	0.4	0.9	2.6	69.5	73.8	80.3
Artistic	0.7	2.9	7.5	0.4	1.8	8.3	17.9	19.4	30.3
Clerical <sup>3</sup>	0.5	2.3	5.7	0.4	2.0	5.9	42.3	53.2	70.1
Sales <sup>3</sup>	0.7	2.8	4.6	0.8	2.8	6.9	35.8	32.3	45.7
Service <sup>3</sup>	1.0	3.1	7.0	0.9	2.9	7.8	40.7	43.1	51.3
Farming	0.2	1.0	2.4	0.1	0.6	2.2	2.4	6.8	19.1
Other Primary	2.5	10.0	12.5	0.9	6.0	11.8	0.0	0.2	1.2
Processing	1.6	6.3	7.4	1.0	4.4	11.5	9.1	9.7	27.7
Machining and Fabricating <sup>3</sup>	1.1	4.3	6.3	0.9	3.0	9.1	15.4	12.3	26.8
Construction	1.6	6.7	9.0	1.5	5.0	12.1	0.9	0.6	1.2
Transport	1.0	4.5	6.5	1.0	2.5	6.1	0.5	0.3	2.3
Other	1.5	4.4	8.9	1.4	4.6	11.4	15.1	14.2	20.2
Unspecified	51.5	6.6	8.2	55.4	4.2	6.9	22.1	16.7	36.1
All occupations	1.5	3.3	5.9	1.2	2.2	6.1	18.2	17.9	35.2

<sup>1</sup>The 1961 and 1971 figures include the Yukon and Northwest Territories; the 1951 figures do not.

<sup>2</sup>See footnote 2, Table 3.3.

<sup>3</sup>More than 5% of the female labour force was in this occupation in 1951, 1961 and 1971 (see Table 2.3.)

Source: Calculated from 1951 Census of Canada, Vol. IV, Table 4; Vol. V, Table 10; 1961 Census of Canada, Vol. III - Part 1, Table 6; Vol. III - Part 3, Table 37; and 1971 Census of Canada, Vol. III - Part 2, Table 2; Vol. III - Part 7, Table 27.

higher for the total labour force than for women in all occupations except the Natural Sciences and Engineering and Sales occupations in 1951, and Natural Sciences and Engineering, Social Sciences, and Other occupations in 1961. On the other hand, in 1971 we find that the unemployment rates were higher for the female than for the total labour force in all occupations except Teaching, Farming, Other Primary, and Transport occupations. Table 3.7 shows that this transition was associated with higher rates of growth for the female than for the total labour force in all occupations except Religion, Teaching, Artistic, Sales, Construction, and Other occupations.

The first two columns of Table 3.8 show the unemployment rates by occupation for women and men who worked part-time weekly hours versus the rates for those who worked full-time hours. For men in all occupations we again find that the unemployment rates are higher for those who usually worked less than 35 hours per week than for those who usually worked 35 hours per week or more. However, women who worked part-time hours have lower unemployment rates than women who worked full-time hours in Managerial, Natural Sciences and Engineering, Religion, Clerical, Services, Processing, Machining and Fabricating, Construction, and Transport occupations. The part-time hours unemployment rates are higher for men than for women for all occupations except Managerial, Social Sciences, Medicine and Health, and Other occupations. On the other hand, for those who worked full-time hours the unemployment rates are lower for men than for women for all occupations except Farming, Construction, Transport, and Unspecified occupations.

From Columns 3 and 4 of Table 3.8 we find that the unemployment rates are substantially higher for those who worked less than 40 weeks than for those who worked 40 weeks or more, for both men and women in all occupations except for Construction for women. And again we find that the part-time weeks unemployment rates are higher for men than for women for all occupations except Managerial, Natural Sciences and Engineering, Religion, and Other occupations; while the rates for those who worked 40 weeks or more are lower for men than for women for all occupations except Artistic, Farming, Transport and Unspecified occupations.

Columns 5 and 6 of Table 3.8 show the unemployment rates by occupation for those who usually worked less than 35 hours per week and less than 40 weeks in 1970, and for those who usually worked 35 hours per week or more and 40 weeks or more in 1970, respectively. Comparing the rates in Column 5 with the rates in Column 3 for all those who worked less than 40 weeks, we find that the rates in Column 5 are

TABLE 3.7. Changes in Unemployment by Occupation, Canada<sup>1</sup>, 1951-71

Occupation	Percentage growth in labour force 1951-71		Distribution of total unemployed <sup>2</sup>			Distribution of female unemployed			Distribution of women not in current labour force	Women not in current labour force as a percentage of all women not currently employed
	Total	Women	1951	1961	1971	1951	1961	1971	1971	1971
Managerial	-17.1	49.7	1.2	1.8	1.1	0.3	1.0	0.9	0.9	80.6
Natural Sciences, Engineering	250.8	274.1	0.3	0.9	1.6	0.2	0.3	0.5	0.4	75.7
Social Sciences	272.9	401.6	0.1	0.2	0.7	0.1	0.5	1.1	1.1	81.0
Religion	-23.0	-69.6	0.0	0.0	0.0	0.0	0.0	0.1	0.1	79.9
Teaching <sup>3</sup>	200.4	170.1	0.2	0.3	1.2	0.4	1.2	2.0	5.3	91.9
Medicine and Health <sup>3</sup>	193.9	219.0	0.5	0.8	1.6	1.9	3.5	3.6	6.2	88.3
Artistic	124.1	98.8	0.3	0.9	1.2	0.3	0.9	1.0	0.9	78.9
Clerical <sup>3</sup>	119.6	167.8	4.2	9.5	15.4	9.7	28.2	30.7	23.7	76.9
Sales <sup>3</sup>	165.2	142.1	2.7	6.0	7.3	5.4	10.9	9.5	8.3	79.0
Service <sup>3</sup>	91.8	96.5	6.7	10.7	13.3	14.9	25.8	19.4	16.7	78.8
Farming	-38.3	228.1	2.4	2.9	2.4	0.3	1.1	1.3	7.4	96.1
Other Primary	-28.8	763.6	6.8	8.5	3.7	0.0	0.1	0.1	0.1	79.3
Processing	-13.2	4.4	7.9	10.3	4.9	3.9	5.6	3.8	2.8	75.7
Machining and Fabricating <sup>3</sup>	32.1	37.7	9.0	14.4	10.9	7.6	9.8	8.2	5.0	72.3
Construction	42.0	31.1	8.3	14.4	10.0	0.4	0.5	0.3	0.2	66.3
Transport	22.2	546.1	3.6	5.9	4.3	0.1	0.1	0.3	0.2	76.0
Other	153.3	144.0	3.6	7.2	8.3	2.9	5.7	4.8	3.1	73.4
Unspecified	1044.5	2314.5	42.3	5.1	11.9	51.4	4.8	12.2	17.7	86.3
All occupations	62.8	153.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	81.2

<sup>1</sup>The 1961 and 1971 figures include the Yukon and Northwest Territories; the 1951 and growth figures do not.

<sup>2</sup>See footnote 2, Table 3.3.

<sup>3</sup>More than 5% of the female labour force was in this occupation in 1951, 1961 and 1971 (see Table 2.3).

Source: Calculated from 1951 Census of Canada, Vol. IV, Table 4; Vol. V, Table 10; 1961 Census of Canada, Vol. III - Part 1, Table 6; Vol. III - Part 3, Table 37; 1971 Census of Canada, Vol. III - Part 2, Tables 2 and 8; Vol. III - Part 7, Table 27.

TABLE 3.8. Unemployment Rates for Labour Force<sup>1</sup> in the Week Prior to Enumeration for the 1971 Census, by Work Status, Sex and Occupation, Canada

Occupation and sex		Work status					
		Usually worked less than 35 hours per week	Usually worked 35 hours per week or more	Worked less than 40 weeks in 1970	Worked 40 weeks or more in 1970	Usually worked less than 35 hours per week and less than 40 weeks in 1970	Usually worked more than 35 hours per week and more than 40 weeks in 1970
Managerial	F	3.2	3.3	12.8	1.4	9.4	1.6
	M	3.0	1.3	8.6	0.9	11.8	0.9
Natural Sciences, Engineering	F	(4.5) <sup>2</sup>	9.4	24.1	1.7	(0.0)	1.0
	M	7.0	3.1	12.9	1.3	(20.0)	1.3
Social Sciences	F	6.7	4.2	9.1	2.1	7.9	1.3
	M	6.6	2.4	10.3	0.8	(13.8)	0.6
Religion	F	(0.0)	(7.7)	(12.5)	(3.7)	- <sup>3</sup>	(5.0)
	M	(6.7)	0.0	(4.5)	0.0	-	0.0
Teaching	F	1.6	1.3	2.9	0.8	2.5	0.6
	M	4.6	0.5	5.6	0.4	10.4	0.2
Medicine and Health	F	6.0	2.1	6.2	1.3	8.5	1.1
	M	3.2	1.9	8.8	0.8	(9.5)	0.8
Artistic	F	6.9	10.2	18.1	2.2	10.7	2.2
	M	18.9	6.2	21.3	3.3	22.8	1.9
Clerical	F	5.6	5.7	12.3	2.9	9.4	3.0
	M	12.0	5.6	20.8	2.2	21.2	2.1
Sales	F	7.6	6.0	10.8	4.0	10.2	3.9
	M	7.7	3.0	13.9	1.5	12.1	1.4
Service	F	8.0	8.8	13.6	4.0	10.9	4.1
	M	10.5	5.4	18.0	2.4	14.2	2.3
Farming	F	3.4	1.5	5.0	0.0	5.8	0.0
	M	5.0	2.0	7.0	0.5	6.5	0.5
Other Primary	F	-	(16.0)	12.5	-	-	-
	M	20.5	13.8	22.7	6.0	25.8	6.1
Processing	F	9.2	10.4	18.2	4.7	13.0	4.9
	M	16.0	5.8	18.3	2.8	21.2	2.6
Machining and Fabricating	F	7.6	8.6	15.1	4.8	9.2	4.8
	M	8.8	5.5	15.4	3.2	14.3	3.2
Construction	F	(0.0)	7.3	(4.5)	(7.4)	-	(8.3)
	M	17.7	7.9	17.3	3.4	20.3	3.3
Transport	F	0.0	5.4	6.1	0.0	(0.0)	(0.0)
	M	13.0	6.1	19.5	2.6	23.8	2.5
Other	F	16.1	12.0	24.4	4.9	18.7	4.1
	M	13.9	7.4	20.8	2.9	19.4	3.0
Unspecified	F	7.7	5.9	10.4	3.3	9.9	3.0
	M	9.9	8.5	17.9	3.8	12.9	3.6
All occupations	F	6.2	5.9	11.5	2.9	9.2	2.9
	M	9.9	5.3	16.5	2.3	15.0	2.3

F = Female M = Male

<sup>1</sup>This table includes only those who were in the labour force in the week prior to 1 June 1971 and who also worked in 1970. The data exclude Prince Edward Island, the Yukon and Northwest Territories.<sup>2</sup>Thirty or less persons in categories for which figures are in parentheses.<sup>3</sup>Five or less persons in categories for which dash is given.

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Individual File.

lower for all occupations except Medicine and Health, Farming, and Transport occupations for women; but are higher for all occupations except Service, Farming, Machining and Fabricating, Other and Unspecified occupations for men. However, the Column 5 rate for all occupations for men is still lower than the comparable Column 3 rate. Again this suggests that those who worked part-time weeks in 1970 were more likely to be unemployed rather than not in the labour force if they usually worked full-time hours in the weeks when they did work. Also the all-occupations rates shown in Column 6 are equal to one significant decimal place to the all-occupations rates shown in Column 4 for both women and men. Looking now just at Columns 5 and 6, we find once more that part-time men have higher unemployment rates than part-time women for all occupations, while for full-time workers the situation is reversed for all occupations except Natural Sciences and Engineering, Farming, Transport, and Unspecified occupations.

Table 3.9 shows the distributions of the women and men who were in the labour force in the enumeration week for the 1971 Census and who also earned employment income in 1970, by weeks worked in 1970 and usual hours of work. We see that 49.9% of the women compared with 72.0% of the men worked 40 weeks or more and 35 hours per week or more. Moreover, among the 1,471,900 women and 1,567,600 men who worked less than 40 weeks or usually worked less than 35 hours per week, 31.4% of the women compared with 17.7% of the men worked less than 40 weeks and usually worked less than 35 hours per week. Note that for the women and men included in Tables 3.5, 3.8 and 3.9, women are 44.3% of all those who worked less than 40 weeks and 63.4% of all those who worked less than 35 hours per week. These figures are very close to the comparable figures shown in Chapter 4 for all those who earned employment income in 1970, whether or not they were in the labour force in the week prior to 1 June 1971.<sup>12</sup>

Over the period 1951-71, Sales, Service, Other Primary, Processing, Machining and Fabricating, Construction, Transport and Other occupations tended to have higher unemployment rates. In 1951, 1961 and 1971, 55.5%, 54.5% and 52.7%, respectively, of the total labour force was in these occupations. The comparable figures for the female labour force are 46.5%, 40.8% and 34.2%, respectively. In other words, while the proportion of the total labour force in the higher unemployment occupations

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See footnote(s) on page 87.

TABLE 3.9. Distribution of Labour Force<sup>1</sup> in the Week Prior to Enumeration for the 1971 Census, by Work Status and Sex, Canada

Item	Usually worked less than 35 hours per week		Usually worked 35 hours per week or more	
	Women	Men	Women	Men
Worked less than 40 weeks in 1970				
Number of workers	462,300	278,300	608,800	1,069,800
Percent	15.7	5.0	20.7	19.1
Worked 40 weeks or more in 1970				
Number of workers	400,800	219,500	1,468,800	4,037,400
Percent	13.6	3.9	49.9	72.0

<sup>1</sup>This table includes only those who were in the labour force in the week prior to 1 June 1971 and who also worked in 1970. The data exclude Prince Edward Island, the Yukon and Northwest Territories.

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Individual File.

remained almost constant, the proportion of the female labour force in these occupations decreased. Despite this, the unemployment rate for women increased compared to that for the labour force as a whole.

Table 3.7 also shows the occupational distribution of women not in the current labour force, and these women as a percentage of all women not currently employed. The occupational distributions of unemployed women and women not in the current labour force are quite similar, although there are several notable exceptions. In the Machining and Fabricating, and Other occupations, where the growth rates for the female labour force have been below average, women not in the current labour force as a percentage of those not currently employed is higher than the average for all occupations. Conversely, in Teaching, Medicine and Health, and Farming occupations, where the growth rates for the female labour force have been above average, women not in the current labour force as a percentage of those not currently employed is above the average for all occupations.

### 3.3. Unemployed Wives as Distinguished from Wives Currently Working and Wives Not in the Market Labour Force

In order to differentiate the characteristics and responses of unemployed wives from the characteristics and responses of wives who worked for pay or profit and wives who have chosen not to join the market labour force at all, it is necessary to return now to the multivariate approach used extensively in Chapter 2. We have first re-estimated the final model presented in Chapter 2 for the probability that a wife will work. Our dependent variable is now the probability that a wife will work for pay or profit in a particular week, rather than the probability that she will earn employment income sometime during a year as in Chapter 2. These probit coefficients are shown in Table 3.10. Note that the directions and relative magnitudes of the revealed responses are essentially the same as those shown in Table 2.10 for the probability that a wife will earn employment income sometime during the period of a year. In the remainder of this section, wives who worked for pay or profit during the enumeration week for the 1971 Census will be referred to as "currently working".

Table 3.11 shows the probit coefficients for this same set of explanatory variables with the dependent variable now representing the probability that a married woman is unemployed given that she is not currently working; that is, given that she did not work for pay or profit during the enumeration week for the 1971 Census. What we are trying to find out is whether the responses to the variables

TABLE 3.10. Probit Estimates for the Probability That a Married Woman is Currently Working

Explanatory variables	Age groups							
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
1. Constant	-.95047 (2.99) <sup>1</sup>	-.53600 (2.04)	-.16985 (.71)	-.34136 <sup>*</sup> (1.58)	-.47092 (2.31)	-1.1633 (5.86)	-1.5042 (7.24)	-1.4240 (6.06)
2. Years of education	.05427 (6.32)	.07043 (9.77)	.05515 (7.62)	.06089 (8.42)	.06196 (8.68)	.06723 (9.37)	.06621 (8.13)	.07505 (8.70)
3. Number of children less than six years of age	-.53532 (9.34)	-.35620 (6.78)	-.42887 (8.56)	-.55285 (9.89)	-.52357 (7.82)	-.89126 (7.00)		
4. Number of children 6-14 years of age	-.13292 (.96)	.00432 (.08)	-.07368 (2.06)	-.08992 (3.42)	-.15899 (6.44)	-.14955 (5.55)	-.07938 (2.24)	-.16999 (2.02)
5. Product of numbers of children less than six and 6-14 years of age	.26236 (2.53)	.09399 (3.56)	.00187 (.09)	-.07685 (4.24)	.09050 (3.77)	.19978 (4.59)		
6. Number of children 19-24 years of age attending school full- or part-time			-.54530 (1.04)	.24136 (2.04)	-.03132 (.66)	.07463 (1.84)	.14275 (2.98)	.21172 (3.28)
7. Number of children ever born		-.13814 (3.78)	-.01615 (.56)	.00319 (.16)	-.02415 (1.49)	-.01207 (.83)	.00346 (.24)	-.01586 (1.04)
8. Employment income of husband	-.00015 (5.90)	-.00011 (8.26)	-.00007 (6.86)	-.00005 (5.98)	-.00003 (3.62)	-.00004 (6.02)	-.00005 (5.16)	-.00005 (3.67)
9. Asset income of family	-.00011 (2.31)	-.00012 (4.70)	-.00010 (3.55)	-.00002 (.98)	-.00001 (.45)	-.00004 (2.61)	-.00004 (2.57)	-.00008 (4.31)
10. Employment income of husband plus asset income of family divided by number of persons in family	.00035 (5.71)	.00023 (6.18)	.00014 (3.46)	.00006 (1.88)	-.00002 (.59)	.00002 (.87)	.00005 (2.30)	.00005 (1.62)
11. Age of wife at first marriage	.00196 (.15)	-.00175 (.19)	-.00801 (1.08)	-.00965 (1.50)	-.00628 (1.17)	.00947 (2.05)	.01600 (3.66)	.00425 (.89)
12. Dummy variable set equal to 1 if religion of wife is Roman Catholic, and equal to 0 otherwise	.06024 (1.18)	.14181 (2.99)	.11508 (2.29)	.12309 (2.44)	.11642 (2.32)	-.01925 (.36)	-.09744 (1.54)	.05128 (.73)
13. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise	-.14440 (2.14)	-.17691 (2.92)	-.20326 (3.13)	-.35890 (5.29)	-.28976 (4.31)	-.20099 (2.81)	-.16158 (1.97)	-.29909 (3.24)
14. Provincial unemployment rate	-.02830 (1.89)	-.03509 (2.56)	-.03900 (2.77)	-.05398 (3.86)	-.04998 (3.58)	-.04443 (3.23)	-.05533 (3.65)	-.03839 (2.28)
15. Local opportunity for jobs index	1.8327 (6.25)	.9556 (3.66)	.7753 (2.99)	1.1497 (4.61)	1.3950 (5.66)	1.7992 (7.20)	1.4180 (5.25)	1.3224 (4.38)
Pseudo R <sup>2</sup>	.2497	.2035	.1292	.1126	.1069	.1164	.0791	.0778
Maximum R <sup>2</sup> for model	.7467	.7225	.7061	.7112	.7224	.7269	.7084	.6855
Pseudo R <sup>2</sup> for model (pseudo R <sup>2</sup> divided by maximum R <sup>2</sup> for model)	.3343	.2817	.1830	.1583	.1480	.1602	.1116	.1135
Number of married women in sample	4438	5541	4762	4613	4570	4476	3509	2941
Number who worked	1967	1883	1436	1441	1552	1578	1075	780
Proportion of married women who worked	.44	.34	.30	.31	.34	.35	.31	.26
Final value of log of likelihood function	-2462.7	-2920.9	-2585.8	-2589.1	-2670.0	-2627.9	-2017.6	-1081.5

<sup>1</sup> Numbers in parentheses are (asymptotic) t-statistics. A coefficient is significant with at least a 95% level of confidence if its t-statistic is greater than or equal to 1.96.

TABLE 3.11. Probit Estimates for the Probability That a Married Woman is Unemployed Given That She is Not Currently Working

Explanatory variables	Age groups							
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
1. Constant	-3.3407 (5.28) <sup>1</sup>	-3.2886 (4.79)	-2.5266 (4.10)	-2.0147 (3.62)	-3.0067 (5.26)	-2.9280 (5.46)	-3.6710 (5.87)	-3.2981 (4.14)
2. Years of education	.03948 (2.39)	.00106 (.06)	.01858 (1.01)	.03370 (1.82)	.00497 (.26)	.01676 (.90)	.03543 (1.69)	-.00325 (.12)
3. Number of children less than six years of age	-.26961 (2.58)	-.37814 (2.97)	-.31923 (2.34)	-.28969 (2.05)	-.22023 (1.35)	-.49962 (1.52)		
4. Number of children 6-14 years of age	-.52297 (1.07)	-.08745 (.71)	.03534 (.42)	-.12001 (1.88)	-.09655 (1.53)	-.21555 (2.76)	.00632 (.07)	-.20935 (.61)
5. Product of numbers of children less than six and 6-14 years of age	.09061 (.23)	.07890 (1.17)	.01663 (.32)	-.00417 (.07)	.02141 (.34)	.10786 (.69)		
6. Number of children 19-24 years of age attending school full- or part-time			-1.5212 (.33)	-1.8448 (1.13)	-.2323 (1.46)	.0696 (.69)	.1098 (.87)	.1166 (.48)
7. Number of children ever born		-.07419 (.92)	-.10061 (1.55)	.06866 (1.44)	.02751 (.69)	.04508 (1.28)	-.02417 (.66)	.00916 (.21)
8. Employment income of husband	-.00005 (1.12)	-.00007 (1.90)	-.00008 (2.50)	-.00002 (.69)	-.00007 (3.07)	-.00006 (2.75)	-.00010 (3.09)	-.00012 (1.86)
9. Asset income of family	-.00012 (.99)	-.00008 (1.00)	-.00004 (.64)	-.00006 (.68)	-.00005 (.94)	-.00011 (1.73)	-.00013 (2.04)	-.00017 (2.02)
10. Employment income of husband plus asset income of family divided by number of persons in family	.00008 (.72)	.00005 (.47)	.00009 (.87)	-.00012 (.94)	.00010 (1.32)	.00007 (1.07)	.00010 (1.24)	.00021 (1.57)
11. Age of wife at first marriage	.04841 (1.91)	.02814 (1.44)	-.00043 (.02)	-.00239 (.15)	.00114 (.09)	.00596 (.53)	-.00874 (.81)	.00225 (.17)
12. Dummy variable set equal to 1 if religion on wife is Roman Catholic, and equal to 0 otherwise	.12293 (1.29)	-.01785 (.16)	.18241 (1.57)	.11128 (.88)	.02386 (.19)	.12915 (1.03)	-.11447 (.71)	-.00367 (.02)
13. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise	-.27267 (2.08)	-.11118 (.77)	-.72422 (4.06)	-.09287 (.55)	-.53439 (3.07)	-.43933 (2.42)	-.06369 (.33)	.01434 (.54)
14. Provincial unemployment rate	-.00219 (.08)	.03555 (1.02)	.04679 (1.33)	-.04554 (1.22)	.06635 (1.88)	.01339 (.37)	.09068 (2.26)	-.01033 (.19)
15. Local opportunity for jobs index	2.1674 (3.68)	3.7253 (4.58)	2.4467 (3.20)	1.4043 (2.14)	2.8912 (3.82)	2.5539 (3.56)	3.9387 (4.23)	3.1925 (2.63)
Pseudo R <sup>2</sup>	.0455	.0360	.0283	.0133	.0196	.0209	.0203	.0086
Maximum R <sup>2</sup> for model	.4054	.2508	.2082	.2005	.2134	.2175	.2041	.1327
Pseudo R <sup>2</sup> for model (pseudo R <sup>2</sup> divided by maximum R <sup>2</sup> for model)	.1123	.1436	.1361	.0662	.0919	.0960	.0997	.0647
Number of married women in sample who did not work	2471	3658	3326	3172	3018	2898	2434	2161
Number of married women who did not work because they were unemployed	179	120	83	75	78	77	59	29
Proportion of non-working wives who were unemployed	.0724	.0328	.0250	.0236	.0258	.0266	.0242	.0134
Final value of log of likelihood function	-584.7	-461.0	-340.5	-333.7	-332.2	-324.7	-252.7	-144.5

<sup>1</sup>Numbers in parentheses are (asymptotic) t-statistics. A coefficient is significant with at least a 95% level of confidence if its t-statistic is greater than or equal to 1.96.

Source: Calculations based on 1971 Census of Canada, Public Use Sample Tape - Family File.

in the model which cause some wives who are not currently working to be unemployed are essentially the same as the responses believed to determine which wives work.

Looking only at the signs of those coefficients that are significantly different from zero with at least a 95% level of confidence, we see that a married woman is more likely to be unemployed than not in the market labour force<sup>13</sup> if she has more formal education, fewer children less than six years of age, fewer children 6-14 years of age, her husband's income is lower, her family's asset income is lower, the language of her home is not French,<sup>14</sup> the provincial unemployment rate is higher and the local opportunity for jobs index is higher. For these variables, this is precisely the same sign pattern observed in Table 3.10 for the probability that a married woman is currently working, with the exception of the positive sign for the provincial unemployment rate variable.<sup>15</sup> Thus the responses that differentiate the unemployed wives from those not in the market labour force appear to be largely the same as the responses that differentiate currently working wives from all those who are not currently working.

This suggests a set of responses common to all wives participating in the market labour force, both those who are currently working and the unemployed. This also provides some justification for the common research practice of estimating a single equation for the probability that a wife will participate in the labour force as either an unemployed or employed worker. The positive coefficients shown for some age groups in Table 3.11 for the provincial unemployment rate variable suggest, however, that although higher unemployment rates may act to discourage labour force participation, thereby reducing the probability that a wife will be either currently working or unemployed, the longer periods of frictional unemployment and higher layoff rates associated with areas of higher unemployment make it more likely that wives who are not currently working in these areas will be found to be unemployed.

In Table 3.12 we differentiate unemployed from currently working wives. The question we are really attempting to answer here is whether the responses to the variables in the model which result in some wives not working while others work are the same responses which result in some wives working while others are unemployed. In other words, are the responses shown in Table 3.12 simply the reverse of the responses shown in Table 3.10?

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See footnote(s) on page 87.

TABLE 3.12. Probit Estimates for the Probability That a Married Woman is Unemployed Given That She is in the Market Labour Force

Explanatory variables	Age groups							
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
1. Constant	-2.5003 (3.75) <sup>1</sup>	-2.7628 (3.81)	-2.4853 (3.73)	-1.9718 (3.05)	-2.7138 (4.29)	-2.1336 (3.63)	-2.7546 (3.86)	-2.4366 (2.71)
2. Years of education	-.01162 (.70)	-.05410 (3.23)	-.02269 (1.22)	-.01736 (.90)	-.04276 (2.21)	-.03252 (1.73)	-.02526 (1.12)	-.05865 (2.09)
3. Number of children less than six years of age	.20954 (1.76)	-.05814 (.43)	.05015 (.36)	.12332 (.72)	.20533 (1.04)	.27083 (.65)		
4. Number of children 6-14 years of age	-.33677 (.70)	-.08651 (.66)	.07567 (.86)	-.08784 (1.22)	-.04039 (.56)	-.10443 (1.17)	.08996 (.94)	-.13762 (.32)
5. Product of numbers of children less than six and 6-14 years of age	-.12582 (.34)	-.01460 (.19)	.00716 (.11)	-.06625 (1.00)	-.06528 (.77)	-.05932 (.31)		
6. Number of children 19-24 years of age attending school full- or part-time			-1.6474 (.22)	-1.9328 (1.45)	-.25306 (1.46)	-.00650 (.06)	.01898 (.13)	-.02746 (.11)
7. Number of children ever born		.02578 (.29)	-.08338 (1.13)	.10242 (1.85)	.05983 (1.31)	.05729 (1.46)	-.00704 (.16)	.02859 (.54)
8. Employment income of husband	.00009 (1.73)	.00004 (1.17)	-.00001 (.27)	.00002 (.67)	-.00005 (2.12)	-.00003 (1.07)	-.00009 (2.28)	-.00010 (1.31)
9. Asset income of family	-.00000 (.01)	.00004 (.47)	-.00008 (1.22)	-.00002 (.26)	-.00005 (.93)	-.00006 (.96)	-.00010 (1.40)	-.00013 (1.39)
10. Employment income of husband plus asset income of family divided by number of persons in family	-.00024 (1.94)	-.00022 (2.16)	-.00006 (.52)	-.00014 (1.16)	.00013 (1.65)	.00005 (.72)	.00012 (1.23)	.00021 (1.34)
11. Age of wife at first marriage	.03883 (1.50)	.02805 (1.39)	.01052 (.59)	.01222 (.66)	.00742 (.56)	-.00150 (.13)	-.01760 (1.49)	.00324 (.23)
12. Dummy variable set equal to 1 if religion of wife is Roman Catholic, and equal to 0 otherwise	.05649 (.60)	-.13317 (1.17)	.06606 (.53)	.02883 (.21)	-.07379 (.56)	.18854 (1.42)	-.05237 (.29)	-.01637 (.07)
13. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise	-.12632 (.94)	.06520 (.44)	-.56533 (2.90)	.16346 (.83)	-.29503 (1.51)	-.27297 (1.37)	.10223 (.43)	.28028 (.91)
14. Provincial unemployment rate	.03385 (1.13)	.06345 (1.78)	.07478 (1.96)	-.00348 (.08)	.10165 (2.71)	.04766 (1.26)	.14439 (3.23)	.02179 (.35)
15. Local opportunity for jobs index	.5983 (.90)	2.6742 (3.07)	1.6749 (2.02)	.4650 (.62)	1.6974 (1.96)	1.1378 (1.45)	3.0268 (2.93)	2.1720 (1.62)
Pseudo R <sup>2</sup>	.0235	.0187	.0143	.0149	.0159	.0107	.0283	.0170
Maximum R <sup>2</sup> for model	.4368	.3646	.3455	.3256	.3191	.3136	.3356	.2658
Pseudo R <sup>2</sup> for model (pseudo R <sup>2</sup> divided by maximum R <sup>2</sup> for model)	.0538	.0513	.0415	.0457	.0499	.0342	.0843	.0639
Number of married women in sample	2146	2003	1519	1516	1630	1655	1134	809
Number of married women who were unemployed	179	120	83	75	78	77	59	29
Proportion of married women who were unemployed	.08	.06	.05	.05	.05	.05	.05	.03
Final value of log likelihood function	-590.4	-435.2	-311.0	-298.6	-300.1	-302.5	-215.6	-118.1

<sup>1</sup>Numbers in parentheses are (asymptotic) t-statistics. A coefficient is significant with at least a 95% level of confidence if its t-statistic is greater than or equal to 1.96.

Source: Calculations based on 1971 Census of Canada, Public Use Sample Tape - Family File.

In Table 3.12 the explanatory variables are the same as in Tables 3.10 and 3.11, but now the dependent variable represents the probability that a married woman is unemployed given that she is participating in the market labour force.

Looking again only at the signs of those coefficients that are significantly different from zero with at least a 95% level of confidence, we see that a married woman who is in the market labour force is more likely to be unemployed than currently working if she has fewer years of formal education, her husband's income is lower, her husband's employment income plus the asset income of her family divided by the number of persons in the family is lower, the language of her home is not French, the unemployment rate in the province where she lives is higher and the local opportunity for jobs index is higher. Thus more plentiful job opportunities would appear to encourage participation in the market labour force, increasing the probability of working and also the probability of frictional unemployment.

On the other hand, wives in homes where the husband's income is high or the language of the home is French are less likely to participate in the market labour force, and hence less likely to be either unemployed or currently working. Also, among wives who choose to participate in the market labour force, we find that those with lower levels of education are relatively more likely to be unemployed versus currently working. Presumably this is due to the lower, and hence less satisfactory, wage offers that would typically be received by these wives. Lower per person family incomes may lead to relatively lower probabilities of a wife being unemployed versus currently working for the younger age groups because these wives are more willing to accept lower wage offers. This pattern is reversed for the older age groups, however, and may be largely an illusion resulting from undiagnosed statistical problems.

Table 3.13 summarizes the sign patterns that emerge from Tables 3.10, 3.11 and 3.12.

Finally Table 3.14 shows the mean values for each of our explanatory variables for all wives in our sample, wives not in the market labour force, unemployed wives and currently working wives. We show these mean values because those differences in the employment status behaviour of wives that cannot be attributed to response differences (that is, differences in coefficient signs and relative

TABLE 3.13. Summary of Findings

Explanatory variables	Sign of impact		
	Probability that a wife is currently working	Probability of being unemployed given that a wife is not currently working	Probability of being unemployed given that a wife is in the current market labour force
1. Years of education	+	+	-
2. Number of children less than six years of age	-	-	?
3. Number of children 6-14 years of age	-	-	?
4. Product of numbers of children less than six and 6-14 years of age	+	?	?
5. Number of children 19-24 years of age attending school full- or part time	+	?	?
6. Number of children ever born	-	?	?
7. Employment income of husband	-	-	-
8. Asset income of family	-	-	?
9. Employment income of husband plus asset income of family divided by number of persons in family	+	?	-
10. Age of wife at first marriage	+	?	?
11. Dummy variable set equal to 1 if religion of wife is Roman Catholic, and equal to 0 otherwise	+	?	?
12. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise	-	-	-
13. Provincial unemployment rate	-	+	+
14. Local opportunity for jobs index	+	+	+

TABLE 3.14. Mean Values of Explanatory Variables for All Wives, Wives Not in the Market Labour Force, Unemployed Wives and Currently Working Wives

Explanatory variables	Age groups							
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
1. Years of education	10.9 <sup>1</sup> 10.2 <sup>2</sup> 11.2 <sup>3</sup> 11.6 <sup>4</sup>	10.6 10.2 10.6 11.5	10.1 9.8 10.1 10.6	9.6 9.3 9.5 10.1	9.4 9.1 9.0 10.0	9.1 8.7 9.0 9.9	9.0 8.7 9.1 9.9	8.7 8.3 8.1 9.8
2. Number of children less than six years of age	0.8 1.2 0.7 0.3	1.1 1.4 0.7 0.6	0.9 1.0 0.5 0.5	0.5 0.6 0.4 0.3	0.2 0.3 0.2 0.1	0.1 0.1 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0
3. Number of children 6-14 years of age	0.0 0.1 0.0 0.0	0.6 0.7 0.5 0.4	1.7 1.8 1.6 1.5	2.0 2.1 1.9 1.8	1.5 1.7 1.2 1.2	0.9 1.0 0.5 0.6	0.4 0.5 0.3 0.3	0.1 0.1 0.0 0.1
4. Product of numbers of children less than six and 6-14 years of age	0.0 0.1 0.0 0.0	0.6 0.8 0.3 0.3	1.3 1.6 0.6 0.6	1.0 1.3 0.7 0.6	0.5 0.7 0.3 0.2	0.2 0.2 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0
5. Number of children 19-24 years of age attending school full- or part-time	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.2 0.2 0.1 0.2	0.3 0.3 0.2 0.3	0.2 0.2 0.2 0.2	0.1 0.1 0.1 0.2
6. Number of children ever born	0.8 1.2 0.7 0.4	1.7 2.0 1.2 1.0	2.6 2.9 2.1 2.1	3.1 3.3 3.3 2.8	3.3 3.6 2.9 2.9	3.2 3.4 2.9 2.7	3.0 3.2 2.7 2.7	2.9 3.0 2.6 2.6
7. Employment income of husband	5941.8 5983.5 5799.7 5910.8	7520.0 7753.1 6390.1 7160.3	8480.2 8860.2 7027.3 7711.9	8685.4 8984.3 7394.1 8116.3	8523.0 8761.2 7165.0 8146.1	8252.7 8552.5 6939.4 7786.3	7274.7 7441.3 5262.4 7023.1	6162.7 6223.5 5429.6 6025.4
8. Asset income of family	95.9 81.7 73.7 114.4	194.2 207.3 137.2 173.1	198.6 207.1 271.6 175.0	266.3 266.4 147.1 272.2	371.5 385.1 305.4 349.1	508.6 542.0 297.3 459.1	692.6 698.0 395.8 697.0	973.0 1039.6 596.9 804.8
9. Employment income of husband plus asset income of family divided by number of persons in family	2322.0 2018.5 2319.3 2675.9	2345.0 2148.0 2226.0 2722.8	2096.1 2057.7 1987.5 2189.4	2010.5 2002.3 1644.4 2047.4	2080.5 2040.9 2028.8 2158.1	2443.6 2412.7 2309.2 2505.6	2653.9 2666.8 2097.6 2700.1	2836.6 2855.1 2702.7 2790.9
10. Age of wife at first marriage	20.2 19.8 20.5 20.6	21.4 20.1 22.1 22.1	21.8 21.7 22.1 22.0	22.3 22.5 21.9 22.0	23.0 23.0 23.0 22.8	23.6 23.5 23.3 23.9	24.6 24.4 23.9 25.2	26.0 26.0 26.0 26.4
11. Dummy variable set equal to 1 if religion of wife is Roman Catholic, and equal to 0 otherwise	0.44 0.46 0.45 0.42	0.48 0.50 0.46 0.45	0.48 0.49 0.44 0.44	0.46 0.49 0.47 0.40	0.46 0.49 0.40 0.39	0.41 0.46 0.40 0.32	0.39 0.43 0.35 0.29	0.37 0.40 0.38 0.29
12. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise	0.23 0.26 0.19 0.20	0.27 0.30 0.26 0.23	0.26 0.29 0.10 0.20	0.24 0.29 0.21 0.15	0.24 0.30 0.13 0.15	0.23 0.29 0.13 0.14	0.23 0.27 0.20 0.13	0.22 0.26 0.21 0.12
13. Provincial unemployment rate	5.9 6.1 5.7 5.6	6.0 6.1 5.9 5.8	5.9 6.1 5.7 5.7	5.9 6.1 5.6 5.5	5.9 6.1 5.8 5.5	5.9 6.1 5.6 5.5	5.9 6.1 6.1 5.5	5.9 6.0 5.7 5.5
14. Local opportunity for jobs index	0.42 0.40 0.43 0.43	0.41 0.40 0.44 0.43	0.41 0.40 0.44 0.42	0.41 0.40 0.42 0.42	0.41 0.40 0.43 0.42	0.41 0.39 0.43 0.43	0.40 0.39 0.44 0.42	0.40 0.39 0.44 0.42

<sup>1</sup>Mean values for all wives in this age group.<sup>2</sup>Mean values for wives in this age group who were not in the market labour force in the enumeration week for the 1971 Census.<sup>3</sup>Mean values for wives in this age group who were unemployed in the enumeration week for the 1971 Census.<sup>4</sup>Mean values for wives in this age group who were currently working in the enumeration week for the 1971 Census.

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Family File.

magnitudes) must presumably be due to systematic differences in the characteristics of these different groups of wives.

Looking first at the personal characteristics of the wives in our sample, we find that for all age groups except the 40-44 and 55-59 age groups, on average, wives not in the market labour force have the least formal education while currently working wives have the most. Moreover, the mean values for unemployed wives, while lying between the means for wives not in the market labour force and those currently working, are consistently closer in value to the means for wives not in the market labour force. Thus unemployed wives are more similar in educational attainments to wives not in the market labour force than to currently working wives.

In terms of children less than six years of age, children 6-14 years of age, the product of the numbers of children in these two age groups and the number of children ever born, on average, wives not in the market labour force have the largest numbers while currently working wives have the fewest. Moreover, in terms of these child-status variables, unemployed wives are now clearly more similar to currently working wives than to wives who have stayed out of the market labour force. No clear patterns are discernable for our remaining child-status variable, the number of children 19-24 years of age attending school full- or part-time.

Our three income variables make it clear that the families of unemployed wives are more needy than either the families of wives not in the market labour force or of currently working wives, particularly for wives in the older age groups. The behaviour of the means for our variable for the employment income of the husband plus the asset income of the family divided by the number of persons in the family is particularly interesting. For the 20-24 and 25-29 age groups, wives not in the market labour force have the lowest mean values for this variable, while currently working wives have the highest mean values. For the age groups in the 30-54 range, unemployed wives always have the lowest mean values for this variable, while currently working wives continue to enjoy the highest mean values. However, for the 55-59 age group, while unemployed wives continue to have the lowest mean for this variable, wives not in the market labour force now enjoy the highest value.

The consistent picture of relatively greater need in families with unemployed wives versus families where the wife is either currently working or not in the market labour force should help to dispel notions that the unemployment problem of

wives is of relatively little importance compared with the unemployment problems of, say, prime-aged men or teenagers. Whatever the personal motivations of these unemployed wives for seeking work in the first place, on average, their families clearly need additional income if the wives could find work.

No clear pattern emerges for our variables for the age of the wife at first marriage.

The mean values for our dummy variable for the wife's religion and our dummy variable for the language of the home are really sample proportions for the number of wives who are Roman Catholic and the number of wives in French-speaking homes relative to the total number of wives in each age group. We observe a steady decrease for almost all age groups from higher proportions of Roman Catholic wives and wives in French-speaking homes among wives who are not in the market labour force, to lower proportions among wives who are unemployed, to still lower proportions among wives who are currently working.

The mean values for our provincial unemployment rate variable are consistently higher for unemployed than for currently working wives. On the other hand, unemployed wives generally have the highest mean values for our local opportunity for jobs index, suggesting again that more available jobs for women encourage more wives to enter the market labour force, and this in turn results in higher levels of frictional unemployment. However, wives not in the market labour force on average live in regions with even higher unemployment rates than the unemployed wives, and in regions with substantially lower mean values for our local opportunity for jobs index than either currently working or unemployed wives. This observation lends considerable credibility to the widely held belief that much of the real unemployment among women is of a disguised nature, and not easily uncovered in government statistics.

FOOTNOTES

<sup>1</sup>Technically the unemployed include all those who looked for work or were on temporary layoff in the week prior to enumeration. Women on layoff were 7.5% of all unemployed women in 1971 (see 1971 Census of Canada, Vol. III-Part 7, Table 13). The behavioural description of the unemployed given in the text, which forms the basis for our interpretation of our multivariate results in Section 3.3, does not necessarily provide an accurate description of the behaviour of those wives who were unemployed because they were on temporary layoff, but who did not look for work in the week prior to enumeration.

<sup>2</sup>See 1971 Census of Canada, Vol. III - Part 7, Table 1.

<sup>3</sup>The increase in the reported unemployment among women may also be due to different, more probing questioning and self-enumeration in 1971. In 1951, the question asked was, "What did this person do mostly during week ending June 2, 1951?" In 1961 and 1971, the question asked was "Did you look for work last week?" There is some indication that the unemployed were under-enumerated in 1961, making this a "transition" in terms of questioning. In addition, because of self-enumeration in 1971, examples of job search behaviour were given. More probing questioning seems particularly to affect the reported unemployment rate for married women (see for instance, N. McIlveen and H. Sims, The Flow Components of Unemployment in Canada, Statistics Canada, Special Labour Force Studies, Series A, No. 11, Ottawa; July 1978).

<sup>4</sup>See Statistics Canada, The Labour Force, Tables 5 and 7 in Vol. 8, No. 1 and Vol. 8, No. 3; Tables 6 and 8 in Vol. 9, No. 5; Tables 7 and 9 in Vol. 10, No. 5; Tables 8 and 10 in Vol. 11-16; and Table 7 in Vol. 17-27.

<sup>5</sup>As indicated, our unemployment data are for the weeks prior to enumeration for the 1951, 1961 and 1971 Censuses. It is, perhaps, important to ask how representative rates based on these data are of annual average weekly unemployment rates. From Statistics Canada, The Labour Force, Vol. 28, No. 6, Table 1 and Vol. 28, No. 12, Table 5, we find, for instance, that the unemployment rate for women in the week ended 22 May, 1971 is one-tenth of a percentage point lower than the annual average of weekly unemployment rates for all months of 1971.

<sup>6</sup>See Chapter 2, Section 2.2.

<sup>7</sup>In Section 3.3, a wife is counted as unemployed if she looked for work or was on temporary layoff in the week prior to enumeration. She is counted as currently working if she worked for pay or profit in the week prior to enumeration. If a wife does not fall into either of these two groups, she is counted as not in the market labour force. Thus this residual group includes unpaid family workers.

<sup>8</sup>See Footnote 3.

<sup>9</sup>Here the term "part-time" is being used to refer to those who either worked less than 35 hours per week or less than 40 weeks per year.

<sup>10</sup>Tables 3.5, 3.8 and 3.9 include only those who were in the labour force (that is, those who were employed or unemployed) in the week prior to 1 June, 1971 and who also earned employment income in the calendar year 1970.

<sup>11</sup>See Table 2.2 in Chapter 2.

<sup>12</sup>See Tables 4.3 to 4.6 in Chapter 4.

<sup>13</sup>We have used the term "market labour force" to denote the labour force excluding unpaid family workers.

<sup>14</sup>We have used the term "French-speaking family" to denote families where the husband has indicated that the language most frequently spoken at home is French.

<sup>15</sup>This may possibly be due to the "added worker" effect, a term used to refer to the observed phenomenon that other family members often enter the labour force when the husband is unemployed or is afraid of becoming unemployed. Our variable for the earned income of the husband in the calendar year 1970 is clearly an imperfect proxy for his labour force status or job security at the time of enumeration in 1971.

## CHAPTER 4

### HOURS WORKED PER WEEK, WEEKS WORKED PER YEAR AND THE INCOMES OF WORKING WIVES

#### 4.1. Introduction

Not all working wives work the same number of hours per week, or the same number of weeks per year. There are also systematic differences between men and women in the average number of hours worked per week and weeks worked per year. These differences in hours and weeks worked account for some portion of the variability among individuals, and hence among families, in earned incomes. The rest of the variability is, of course, due to differences in wage rates.

In Section 4.2, we attempt to relate the observed historical patterns, by industry and occupation, in women's wage and salary incomes to industrial and occupational patterns in women's hours and weeks of work. In Sections 4.3 and 4.4 we return to a cross-sectional multivariate approach in addressing the question: What are the personal and regional characteristics that determine the annual hours of work, the wage rates, and hence the earned incomes of wives who work? Finally in Section 4.5 we re-examine the multivariate estimation results presented in Section 4.4, together with results for the probability of a wife working presented in Section 2.5 of Chapter 2, to determine how well our estimated cross-sectional relationships explain the observed labour force behaviour of different groups of wives.

#### 4.2. Historical Changes in the Hours Worked Per Week, Weeks Worked Per Year and Earned Incomes of Women

In this section we will first examine general patterns from 1950-51 to 1970-71 in wage and salary income by industry and occupation. Then we will use primarily 1960-61 and 1970-71 data to analyse patterns in hours worked per week, and weeks worked per year by occupation and by industry.

The average woman earns less than the average for all wage earners (men and women taken together) in all industries. This is shown in Table 4.1.<sup>1</sup> Moreover, the average growth in income from wages and salaries is less for women than it is for all wage earners in all industries.

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See footnote(s) on page 115.

TABLE 4.1. Average Wage and Salary Income and Percentage Growth in Wage and Salary Income for Total Wage Earners and Women Wage Earners, by Industry, Canada,<sup>1</sup> 1951, 1961 and 1971

Industry	Total wage earners			Women wage earners			Percentage growth 1951-71	
	1951	1961	1971	1951	1961	1971	Total	Women
Agriculture	938	1298	2598	718	765	1798	177.0	150.4
Forestry	1495	2318	5499	1148	1783	3041	267.8	164.9
Fishing and Trapping	1253	1754	3382	1195	1620	2793	170.0	133.7
Mining	2436	4305	7507	1744	2886	4375	208.2	150.9
Manufacturing <sup>2</sup>	2101	3572	6219	1399	2052	3582	196.0	156.0
Construction	1847	3026	6217	1508	2290	3879	236.6	157.2
Transportation	2240	3675	6903	1592	2445	4238	208.2	166.2
Trade <sup>2</sup>	1849	2917	4696	1239	1732	2712	154.0	118.9
Finance <sup>2</sup>	2116	3644	6023	1504	2310	3719	184.6	147.3
Community-Personal Service <sup>2</sup>	1409	2486	4882	1098	1897	3769	246.5	243.3
Public Administration	2141	3756	6859	1618	2603	4505	220.4	178.4
Unspecified	1253	2983	4677	1088	1954	2967	273.3	172.7
All industries	1905	3182	5642	1278	1995	3562	196.1	178.7

<sup>1</sup> 1961 data include the Yukon and Northwest Territories; 1951 and 1971 do not. Prince Edward Island is excluded from 1971 data.

<sup>2</sup> More than 5% of the female labour force with work experience was in this industry in 1951, 1961 and 1971 (see Table 2.2).

Source: Calculated from 1951 Census of Canada, Vol. V, Table 24; 1961 Census of Canada, Vol. III - Part 3, Table 28; and 1971 Census of Canada, Public Use Sample Tape - Individual File.

Looking at Table 4.2, we find that the average woman earns less than the average for all wage earners in all occupations as well. We also find that the only occupations where the average growth in wage and salary incomes is greater for women than for all wage earners are the Natural Sciences and Engineering, Religion, Medicine and Health, Artistic, and Construction occupations. With the exception of Medicine and Health, less than 5% of all women in the labour force with work experience were in each of these occupations in 1951, 1961 and 1971. Thus we find that the average woman not only earns less than the average for all wage earners in all industries and occupations, but this disparity has been increasing over time for all industries and all except a few occupations.<sup>2</sup>

It is commonly alleged that earnings are lower not only for women but also for men in industries or occupations where women are employed in substantial numbers. This is supposedly because women are willing to work for less, as evidenced by their lower wage and salary incomes in every industry and occupation; hence women undermine the competitive position of all workers in the industry or occupation. No evidence of such a phenomenon can be found in Tables 4.1 and 4.2, however. We find from Table 4.1 that average wage and salary incomes have always been above the all-industries averages for both women and all wage earners, respectively, for two of the female-oriented industries (Manufacturing and Finance); and have generally been below the all-industries averages for the other two female-oriented industries (Trade and Community-Personal Service).

From Table 4.2 we find that, for all wage earners, the average wage and salary incomes have generally been above the all-occupations averages in three of the female-oriented occupations (Teaching, Sales, and Machining and Fabricating), and have always been below the all-occupations averages for the other three female-oriented occupations (Medicine and Health, Clerical, and Service). Likewise, for women wage earners the average wage and salary incomes have generally been above the all-occupations averages for women for Teaching, Medicine and Health, and Clerical occupations; and have always been below the all-occupations averages for Sales, Service, and Machining and Fabricating occupations. Thus it simply is not true that wage and salary incomes are below average for either women or wage earners as a whole in the majority of the female-oriented industries and occupations.

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See footnote(s) on page 115.

TABLE 4.2. Average Wage and Salary Income and Percentage Growth in Wage and Salary Income for Total Wage Earners and Women Wage Earners, by Occupation, Canada,<sup>1</sup> 1951, 1961 and 1971

Occupation	Total wage-earners			Women wage-earners			Percentage growth in wages and salaries	
	1951	1961	1971	1951	1961	1971	Total	Women
Managerial	3143	6347	11620	\$ 1974	3262	6287	269.7	218.5
Natural Sciences, Engineering	2877	5447	8955	1725	2984	5613	211.3	225.4
Social Sciences	2510	4837	6883	1884	3195	5116	174.2	171.5
Religion	1081	2437	4295	555	1615	2918	297.3	425.8
Teaching <sup>2</sup>	1887	4186	7201	1589	3382	5949	281.6	274.4
Medicine and Health <sup>2</sup>	1468	2554	4974	1256	2169	4338	238.8	245.4
Artistic	2364	3980	5953	1562	2531	3989	151.8	155.4
Clerical <sup>2</sup>	1796	2741	4418	1540	2329	3691	146.0	140.0
Sales <sup>2</sup>	1926	2989	5729	1060	1367	2467	197.5	132.7
Service <sup>2</sup>	1401	2229	3989	806	1082	2103	184.7	160.9
Farming	948	1337	2699	636	607	1777	184.7	179.4
Other Primary	1749	2813	5678	995	1525	2066	224.6	107.6
Processing	1840	2859	5625	1276	1718	3183	205.7	149.5
Machining and Fabricating <sup>2</sup>	2012	3189	5928	1267	1731	3144	194.6	148.1
Construction	2008	3215	6330	1179	1466	4086	215.2	246.6
Transport	2152	3473	6103	1256	1559	2809	183.6	123.6
Other	2064	3541	5333	1244	1887	3027	158.4	143.3
Unspecified	1537	2661	4818	1173	1913	3066	213.5	161.4
All occupations	1905	3186	5643	1278	1995	3563	196.2	178.8

<sup>1</sup>1961 data include the Yukon and Northwest Territories; 1951 and 1971 do not. 1971 data also exclude Prince Edward Island.

<sup>2</sup>More than 5% of the female labour force with recent work experience were in this occupation in 1951, 1961, and 1971 (see Table 2.3).

Source: Calculated from 1951 Census of Canada, Vol. V, Table 24; 1961 Census of Canada, Vol. III - Part 3, Table 28; and 1971 Census of Canada, Public Use Sample Tape - Individual File.

However, differences in the average wage and salary incomes of women versus all wage earners, and the above and below patterns of average incomes in the female-oriented industries and occupations versus the all-industries and all-occupations averages, can be linked directly to the proportion of women and all wage earners working part-time hours or part-time weeks.

Making such comparisons over time (as opposed to comparisons between, say, women and all wage earners for individual census years) is hazardous. First, in contrast to the 1951 and 1961 data, the 1971 data are based on self-enumeration, and hours and weeks of work reported may therefore be affected. Next, looking specifically at "hours worked per week", for 1951 this term refers to the actual number of hours worked in the week before enumeration. For 1961 this term refers to the total number of hours usually worked per week at all jobs in the previous 12 months. For 1971 this same term refers to the number of hours usually worked per week at the job held in the week prior to enumeration if employed then, and otherwise at the job held for the longest duration over the period from 1 January 1970 until enumeration.<sup>3</sup>

Bearing this in mind, from Tables 4.3 and 4.4,<sup>4</sup> we see that in each industry and each occupation the percentage of women wage earners who work less than 35 hours per week is higher than the equivalent percentage for all wage earners. On this basis, we would expect the average industry and occupation-specific wage and salary incomes for women to be lower than for all wage earners, as, in fact, we have seen they are.

Secondly, from Table 4.3 we see that the female-oriented industries with above-average wage and salary incomes for both women and all wage earners are precisely the female-oriented industries with proportions of women and all wage earners working less than 35 hours per week which are always below the respective all-industries averages; and vice versa for the remaining female-oriented industries.

No such clear picture emerges for the female-oriented occupations comparing the occupation-specific proportions of women and all wage earners working less than 35 hours per week shown in Table 4.4 with the income data for occupations shown in Table 4.2.

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See footnote(s) on page 115.

TABLE 4.3. Employed Wage Earners (1951) and Wage Earners in the Labour Force (1961 and 1971), by Hours of Work and by Industry, Canada,<sup>1</sup> 1951, 1961 and 1971

Industry	Total working less than 35 hours per week as percentage of total in industry			Women working less than 35 hours per week as percentage of women in industry			Women as percentage of those working less than 35 hours per week		
	1951	1961	1971	1951	1961	1971	1951	1961	1971
Agriculture	5.7	8.8	24.4	18.6	25.3	36.7	20.5	31.1	35.3
Forestry	5.7	1.9	5.6	6.5	8.9	21.6	2.4	10.2	19.8
Fishing and Trapping	9.4	3.8	11.8	13.0	18.2	29.0	4.7	16.0	15.2
Mining	2.4	0.9	1.9	5.3	7.4	10.5	5.0	33.6	36.1
Manufacturing <sup>2</sup>	3.0	3.4	4.8	6.4	8.5	10.4	45.4	54.6	49.9
Construction	4.0	3.0	6.3	8.9	19.2	30.8	4.5	17.8	25.5
Transportation	2.7	4.6	8.0	5.7	13.6	21.1	26.9	42.7	45.6
Trade <sup>2</sup>	6.4	12.4	22.2	11.2	24.8	39.8	62.0	65.8	66.5
Finance <sup>2</sup>	4.5	7.5	13.1	5.8	10.8	17.5	63.8	70.3	69.2
Community-Personal Service <sup>2</sup>	10.3	17.8	26.5	12.7	22.6	33.9	77.2	80.0	76.4
Public Administration	3.7	4.4	11.8	10.8	12.0	23.4	51.7	48.4	50.5
Unspecified	18.6	8.7	18.9	17.9	18.8	29.5	14.8	57.9	59.1
All industries	5.0	8.2	15.3	10.0	18.3	28.7	52.9	66.2	65.2

<sup>1</sup> 1951 data do not include the Yukon and Northwest Territories; 1961 and 1971 data do. See text for discussion of comparability of data.

<sup>2</sup> More than 5% of the female labour force with work experience was in this industry in 1951, 1961 and 1971 (see Table 2.2).

Source: Calculated from 1951 Census of Canada, Vol. V, Table 8; 1961 Census of Canada, Vol. III - Part 3, Table 21; and 1971 Census of Canada, Vol. III - part 7, Table 32.

TABLE 4.4. Wage Earners in the Labour Force, by Hours of Work and by Occupation, Canada,<sup>1</sup> 1961 and 1971

Occupation	Total working less than 35 hours per week as percentage of total in occupation		Women working less than 35 hours per week as percentage of women in occupation		Women as percentage of those working less than 35 hours per week	
	1961	1971	1961	1971	1961	1971
Managerial	2.0	7.3	9.0	17.6	34.4	38.2
Natural Sciences, Engineering	1.4	4.2	5.4	11.1	18.9	19.4
Social Sciences	9.2	18.7	17.6	25.9	68.1	58.0
Religion	4.1	9.2	13.5	24.0	27.1	41.2
Teaching <sup>2</sup>	28.2	39.3	35.0	48.4	78.8	74.2
Medicine and Health <sup>2</sup>	8.4	17.1	9.9	19.9	94.0	92.7
Artistic	19.9	26.3	37.9	41.3	52.1	44.1
Clerical <sup>2</sup>	8.9	18.6	11.9	23.0	81.6	84.1
Sales <sup>2</sup>	15.9	22.5	33.1	46.2	65.3	63.1
Service <sup>2</sup>	13.8	25.8	25.6	40.9	80.9	73.0
Farming	8.6	22.9	33.6	36.7	29.1	27.2
Other Primary	1.4	4.6	7.2	17.9	1.7	6.2
Processing	4.3	5.3	9.2	13.4	31.3	45.1
Machining and Fabricating <sup>2</sup>	2.7	3.3	7.1	7.8	45.2	44.9
Construction	2.2	4.4	16.8	12.1	5.9	2.6
Transport	3.1	8.6	37.4	47.6	6.7	13.1
Other	4.1	12.1	9.4	16.8	30.7	21.8
Unspecified	6.8	18.9	17.1	29.7	59.3	58.1
All occupations	7.8	15.6	17.9	28.8	66.4	64.0

<sup>1</sup>Data include the Yukon and Northwest Territories. See text for discussion of comparability of data.

<sup>2</sup>More than 5% of the female labour force with work experience was in this occupation in 1961 and 1971 (see Table 2.3).

Source: Calculated from 1961 Census of Canada, Vol. III - Part 3, Table 22; 1971 Census of Canada, Vol. III - Part 7, Table 31.

Comparisons over time for weeks worked per year are also difficult. First, in 1951, part-time employment was converted to a full-time weekly basis and, as a result, these data are not comparable to the data for 1961 and 1971. Second, the data for 1961 refer to the weeks worked for wages and salaries during the previous 12 months, whereas the 1971 data refer to the calendar year of 1970, and, in addition, may include some weeks in which the work done was for profit rather than for wages and salaries.<sup>5</sup>

Bearing these cautions in mind, from Table 4.5 we see again that the female-oriented industries with above-average wage and salary incomes for both women and all wage earners are also the female-oriented industries with proportions of women and all wage earners working less than 40 weeks per year which are always below the respective all-industries averages. The reverse is generally true for the remaining female-oriented industries. Moreover, comparing Tables 4.6 and 4.2, we now find a similar pattern for the female-oriented occupations as well, the sole exception being the Clerical occupation.

Thus, at the level of aggregation at which we are examining these data, lower wage and salary incomes for both women and all wage earners are found to be associated not with the degree to which an industry or occupation is female-oriented, but rather with the proportions of women and all wage earners, respectively, who are working part-time hours or part-time weeks.

In addition, we also see from Tables 4.3 and 4.4 that the percentage of women working less than 35 hours per week has been increasing over time in every industry and occupation. We see, however, that the comparable industry and occupation-specific percentages for all wage earners have also, in general, increased over time. Thus it would appear that working part-time hours has become more common for everyone, not just for women. Moreover the rates of increase in women and all wage earners working part-time hours have been such as to leave the all-industries and all-occupations ratios of women to all wage earners working less than 35 hours per week virtually unchanged.

Looking now at Tables 4.5 and 4.6 we find that both the percentages of women and the percentages of all wage earners working less than 40 weeks per year

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See footnote(s) on page 115.

TABLE 4.5. Wage Earners in the Labour Force, by Weeks of Work and by Industry, Canada,<sup>1</sup> 1961 and 1971

Industry	Total working less than 40 weeks per year as percentage of total in industry		Women working less than 40 weeks per year as percentage of women in industry		Women as percentage of those working less than 40 weeks per year	
	1961	1971	1961	1971	1961	1971
Agriculture	51.6	53.5	69.7	59.1	14.0	27.4
Forestry	67.4	52.1	52.9	50.0	1.6	4.8
Fishing and Trapping	70.0	64.6	56.8	50.0	2.8	5.9
Mining	17.5	21.7	17.9	25.5	4.1	8.4
Manufacturing <sup>2</sup>	17.5	21.5	24.7	29.9	30.9	33.1
Construction	46.4	39.4	24.5	25.1	1.5	2.9
Transportation	17.4	18.2	16.1	24.3	13.3	23.3
Trade <sup>2</sup>	20.0	27.7	26.7	35.9	43.9	49.1
Finance <sup>2</sup>	12.1	19.1	16.1	25.9	65.5	71.9
Community-Personal Service <sup>2</sup>	24.9	31.1	28.3	34.9	70.0	66.4
Public Administration	13.6	18.4	19.1	27.6	25.0	36.7
Unspecified	27.8	33.5	27.8	36.5	26.4	38.5
All industries	22.6	26.7	25.6	33.0	32.7	42.6

<sup>1</sup>1961 data include the Yukon and Northwest Territories; 1971 data exclude the Yukon and Northwest Territories and Prince Edward Island.

<sup>2</sup>More than 5% of the female labour force with work experience was in the industry in 1961 and 1971 (see Table 2.2)

Source: Calculated from 1961 Census of Canada, Vol. II - Part 3, Table 22; and 1971 Census of Canada, Public Use Sample Tape - Individual File.

TABLE 4.6. Wage Earners in the Labour Force, by Weeks of Work and by Occupation,  
Canada,<sup>1</sup> 1961 and 1971

Occupation	Total working less than 40 weeks per year as percentage of total in occupation		Women working less than 40 weeks per year as percentage of women in occupation		Women as percentage of those working less than 40 weeks per year	
	1961	1971	1961	1971	1961	1971
Managerial	3.6	7.4	9.1	14.1	20.4	31.0
Natural Sciences, Engineering	11.4	17.2	19.7	29.1	8.4	12.6
Social Sciences	13.7	32.7	19.8	38.4	51.5	53.9
Religion	5.4	11.8	11.9	18.8	18.2	12.5
Teaching <sup>2</sup>	11.2	26.5	13.9	31.0	79.2	69.2
Medicine and Health <sup>2</sup>	22.9	29.5	25.7	31.4	89.2	86.1
Artistic	20.0	32.9	25.9	38.1	35.5	35.1
Clerical <sup>2</sup>	16.3	24.5	18.6	26.7	69.6	73.8
Sales <sup>2</sup>	20.1	23.9	32.3	39.8	50.2	50.7
Service <sup>2</sup>	25.4	31.7	37.1	43.8	63.7	61.6
Farming	51.7	55.6	78.1	57.7	11.2	17.4
Other Primary	51.4	44.8	58.8	85.0	0.4	3.1
Processing	30.2	23.8	33.9	37.8	16.5	27.2
Machining and Fabricating <sup>2</sup>	22.1	21.6	27.6	33.3	21.8	29.8
Construction	35.2	34.7	39.7	38.5	0.9	0.9
Transport	22.7	23.5	33.6	43.5	0.8	3.8
Other	20.6	29.0	27.7	36.8	18.2	18.7
Unspecified	24.8	32.4	28.1	36.2	26.6	39.4
All occupations	22.6	26.7	25.6	33.0	32.7	42.6

<sup>1</sup>1961 data include the Yukon and Northwest Territories; 1971 data exclude the Yukon and Northwest Territories and Prince Edward Island.

<sup>2</sup>More than 5% of the female labour force with work experience was in this occupation in 1961 and 1971 (see Table 2.3).

Source: Calculated from 1961 Census of Canada, Vol. III - Part 3, Table 22; and 1971 Census of Canada, Public Use Sample Tape - Individual File.

have been increasing over time in virtually every industry and occupation. In this case, however, the ratios of women to all wage earners working less than 40 weeks per year have increased in all industries except Community-Personal Service, and in all occupations except Religion, Teaching, Medicine and Health, Artistic, Service, and Construction occupations.

Differences in the numbers of hours and weeks worked account in part for differences between the sexes in annual incomes. However, they are only one source of these income discrepancies. For families in which both the husband and wife earned employment income in 1970 (the same sample of families analysed in Section 4.3), as we see from Table 4.7, the average for the wife's hourly wage rate is also generally lower than the average for the husband's hourly wage. The exceptions to this rule are the two oldest age groups. The greatest difference occurs for families where the wife is aged 40-44. This suggests the possibility that women who re-enter the labour force, or enter the labour force for the first time as their children grow older, may start out with relatively low wages, thus lowering the average income for all women workers in this age bracket.

#### 4.3. The Interaction Between a Married Woman's Offered Wage, Asking Wage and Hours Worked

A wife's annual earned income equals her annual hours of work multiplied by her hourly offered wage rate. In Chapter 2 we addressed the question of how likely it is that a particular wife will work at all. We will now examine, for wives who earned employment income in 1970, the determinants of the annual number of hours worked and their hourly wage rates.<sup>6</sup>

The behavioural hypothesis underlying the estimation results presented in Chapter 2 is that a woman will work if her offered wage is greater than her asking wage at zero hours of work. Moreover, for women who do work, we argued in Chapter 2 that the asking wage will increase with increases in the number of hours worked because of the increased costs to a family as the wife works more hours.

We will now broaden this hypothesis to include the further behavioural assumption that women who work will attempt to adjust their hours of work so as to equate their asking wage rates with their offered wage rates. The idea is that a

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See footnote(s) on page 115.

TABLE 4.7. Mean Hourly Wages by Age of Wife for Families in Which Both Husband and Wife Earned Employment Income in 1970

Age of wife	Mean wage of husband	Mean wage of wife
15-19	3.09	1.79
20-24	3.42	2.70
25-29	3.97	3.31
30-34	4.27	3.43
35-39	4.26	3.13
40-44	4.36	3.02
45-49	4.39	3.16
50-54	3.99	2.96
55-59	4.01	2.96
60-64	3.53	3.60
65 +	2.30	2.92

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Family File.

woman whose market wage rate is higher than the monetary value she subjectively places on an hour of her own time, given her present hours of work, can potentially increase her own well-being by working more hours, which will raise her asking wage. The word "well-being" here is intended to include not only a woman's perception of her own self-interests, but also her concern for the well-being of her family. If people generally strive to maximize their well-being, then on average it would seem reasonable to assume that the offered wage rates for married women who work will equal their otherwise unobservable asking wages.

If the asking wage for women who work can be conceived of as a function of the hours worked and other variables discussed in Section 2.3 of Chapter 2, and if this asking wage is equal on average to the offered wage for women who work, then we can solve this relationship for the number of hours worked as a function of the offered wage rate and the other variables believed to determine the asking wage rate. Our expectation is that the variables, other than the offered wage rate, that enter into the hours equation will have coefficients of the opposite signs from their expected signs in the asking wage equation. For instance, we have argued in Section 2.3 that an increase in the number of children under six years of age will increase a married woman's asking wage, all other factors remaining unchanged. Therefore we would expect that this same increase in the number of children under six years of age would tend to reduce the number of hours worked.

The sign of the coefficient of the offered wage rate in the hours of work equation is expected to reflect the balance between the direct positive effects of increases in the offered wage rate on the number of hours of work (the substitution effect), and a secondary negative effect that comes about because the more a woman is paid per hour the fewer hours she will need to work to earn any given level of income (the income effect). If these two effects are approximately of equal strength on average, then we would expect this coefficient to be insignificant. That is, we would not expect to be able to reject the hypothesis that the true value of this coefficient is zero.

#### 4.4. Empirical Estimates of the Impact of Various Variables on a Married Woman's Offered Wage and Hours of Work

Table 4.8 summarizes our hypotheses about which variables affect a married woman's offered wage and her hours of work, and the expected signs of the impacts of these variables. The estimated rather than the actual offered wage appears in the

TABLE 4.8. Summary of Hypotheses About Factors Affecting the Offered Wage and Hours of Work

Explanatory variables	Expected sign of impact	
	Wife's offered wage	Annual hours of work
1. Wife's offered wage		?
2. Years of education	+	+
3. Number of children less than six years of age	-	-
4. Number of children 6-14 years of age		-
5. Product of numbers of children less than six and 6-14 years of age		+
6. Number of children 19-24 years of age attending school full- or part-time		+
7. Number of children ever born		-
8. Employment income of husband		-
9. Asset income of family		-
10. Employment income of husband plus asset income of family divided by number of persons in family		?
11. Age of wife at first marriage	+	
12. Dummy variable set equal to 1 if religion of wife is Roman Catholic, and equal to 0 otherwise		-
13. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise		-
14. Provincial unemployment rate	-	
15. Local opportunity for jobs index	+	

hours of work function, where these estimated values are obtained from the estimated version of our offered wage equation for which coefficients are shown in Table 4.9. This substitution has been made to avoid statistical problems that arise because, for any one woman, some of the factors that affect the offered wage, but are not explicitly controlled for in our analysis, will also affect the hours of work. Thus the actual offered wage may be correlated with factors omitted from our analysis of the hours of work. This violates an underlying assumption of the estimation technique we have used. The estimated values of the offered wage, on the other hand, reflect only the influence of those variables explicitly included in our analysis of the offered wage. Thus the problems arising from the existence of correlations between included and omitted variables are avoided.

We will now consider the choice of functional forms for the relationships summarized in Table 4.8. When a linear form is assumed for the relationship between some dependent variable and one or more explanatory variables, it means that a unit change in an explanatory variable will be associated with a change in the dependent variable equal in value to the coefficient of the explanatory variable. When the log of a dependent variable is linearly related to one or more explanatory variables, a unit change in an explanatory variable will be associated with a percentage change in the dependent variable equal to the coefficient of the explanatory variable. Finally when a dependent variable is related to the log of one or more explanatory variables, then a change of 1% in one of these explanatory variables will be associated with a change in the dependent variable equal to the coefficient of the log of the explanatory variable.

Our best results were obtained by assuming linear relationships between the log of the wife's offered wage and the associated explanatory variables in their original forms, and between the annual hours worked and all the associated explanatory variables in their original forms except the wife's offered wage, which was entered in log form.<sup>7</sup> Our estimation results for these relationships are shown in Tables 4.9 and 4.10 for wives aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54 and 55-59 who earned employment income in 1970. As in Chapter 2, we will refer throughout the remainder of this chapter to wives who earned employment income in 1970 as "wives who worked". The age groups of 15-19, 60-64 and 65 and over were

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See footnote(s) on page 115.

TABLE 4.9. Generalized Least Squares Estimates for Log of Offered Wage Equation

Explanatory variables	Age groups							
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
1. Constant	-0.9569 (4.25) <sup>1</sup>	0.3312 (1.78)	-0.0578 (0.25)	-0.6921 (1.99)	1.3109 (5.69)	-1.2278 (4.99)	-1.2796 (2.36)	-1.6317 (2.95)
2. Years of education	0.0386 (7.65)	0.0702 (14.98)	0.0698 (11.53)	0.0659 (9.97)	0.0445 (8.39)	0.0671 (12.28)	0.0604 (7.81)	0.0774 (8.39)
3. Number of children less than six years of age	0.0114 (0.20)	-0.0022 (0.07)	0.0656 (1.70)	-0.0801 (1.83)	0.0258 (0.45)	-0.2566 (2.59)	-	-
4. Age of wife at first marriage	0.0274 (4.68)	0.0076 (1.72)	0.0032 (0.70)	0.0086 (1.79)	-0.0033 (0.91)	0.0039 (1.24)	0.0038 (1.18)	0.0106 (2.82)
5. Provincial unemployment rate	0.0212 (2.53)	0.0012 (0.15)	0.0048 (0.41)	0.0039 (0.30)	0.0128 (1.06)	-0.0052 (0.44)	-0.0236 (1.66)	0.0087 (0.55)
6. Local opportunity for jobs index	0.3861 (2.15)	-0.2826 (1.56)	0.4656 (2.00)	0.6036 (2.40)	0.2790 (1.45)	1.1346 (5.30)	1.3342 (4.19)	1.1918 (3.53)
7. Selection bias ( $\lambda$ )	0.1360 (0.83)	-0.2349 (2.38)	-0.1768 (1.13)	0.2633 (1.49)	-0.8940 (4.86)	0.6587 (4.32)	0.6652 (2.46)	0.4094 (1.63)
Combined grouped $R^2 = 0.7307^2$								
$R^2$	.2033	.3421	.2058	.1142	.1525	.2200	.1049	.2170
Standard error of regression	1.01	1.00	1.01	1.00	1.03	1.01	1.00	1.00

<sup>1</sup>Numbers in parentheses are t-statistics. A coefficient is significant with at least a 95% level of confidence if its t-statistic is greater than or equal to 1.96.

<sup>2</sup>Explained in Section 4.5.

Source: Calculations based on 1971 Census of Canada, Public Use Sample Tape - Family File.

TABLE 4.10. Two-Stage Generalized Least Squares Estimates for Annual Hours of Work Equation

Explanatory variables	Age groups							
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
1. Constant	1899.474 (13.88) <sup>1</sup>	2308.443 (11.99)	1829.135 (6.75)	2022.421 (8.21)	2313.827 (8.08)	1655.294 (6.07)	1410.875 (2.49)	1582.385 (2.68)
2. Log of wife's offered wage	-263.476 (2.13)	-390.432 (3.17)	-202.650 (1.30)	-232.312 (1.56)	-394.536 (2.38)	124.296 (0.69)	393.912 (1.11)	154.818 (0.59)
3. Number of children less than six years of age	-202.8060 (4.02)	-196.1778 (3.90)	-182.2498 (2.25)	-202.1024 (3.18)	-236.4846 (3.79)	-188.9221 (1.82)		
4. Number of children 6-14 years of age	-74.9284 (0.88)	-28.0944 (0.70)	-15.1281 (0.42)	-32.8032 (1.24)	-57.7489 (2.18)	-67.8002 (1.91)	-50.5176 (1.27)	-43.2357 (0.50)
5. Product of numbers of children less than six and 6-14 years of age	106.3121 (1.75)	-2.1273 (0.11)	-15.2006 (0.98)	29.1294 (1.84)	81.7461 (3.99)	10.1061 (0.25)		
6. Number of children 19-24 years of age attending school full- or part-time			-567.8390 (1.24)	57.8358 (0.53)	15.0697 (0.35)	-5.7371 (0.15)	23.0664 (0.48)	37.6488 (0.46)
7. Number of children ever born		-3.5021 (0.13)	15.8389 (0.60)	-16.2456 (0.95)	-14.6428 (1.09)	-6.6159 (0.54)	-21.6208 (1.53)	-11.7604 (0.81)
8. Employment income of husband	-0.0384 (2.38)	-0.0303 (2.49)	-0.0624 (4.84)	-0.0193 (2.17)	-0.0216 (3.01)	-0.0304 (3.72)	-0.0396 (3.46)	-0.0253 (1.31)
9. Asset income of family	-0.0442 (1.57)	-0.0400 (2.10)	-0.0423 (1.78)	-0.0092 (0.58)	-0.0192 (1.35)	-0.0292 (2.12)	-0.0395 (2.35)	-0.0360 (1.44)
10. Employment income of husband plus asset income of family divided by number of persons in family	0.0979 (2.42)	0.0784 (2.47)	0.1630 (4.32)	0.0636 (2.08)	0.0480 (1.78)	0.0487 (2.36)	0.0807 (3.82)	0.0507 (1.41)
11. Dummy variable set equal to 1 if religion of wife is Roman Catholic, and equal to 0 otherwise	64.9038 (2.14)	33.8593 (0.97)	52.9263 (1.13)	162.4311 (3.48)	148.1271 (3.32)	58.9597 (1.28)	-12.0270 (0.19)	38.5949 (0.57)
12. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise	10.9872 (0.28)	71.7960 (1.47)	-40.5282 (0.75)	-59.1221 (0.68)	-49.9442 (0.73)	-71.6121 (0.90)	107.9597 (1.19)	208.1113 (1.56)
13. Selection bias (1)	409.2893 (4.72)	329.5043 (3.04)	552.9555 (3.44)	323.9883 (2.74)	378.4971 (3.26)	496.7364 (4.24)	376.4111 (2.20)	322.5138 (1.76)
Combined grouped $R^2 = 0.9591^2$								
$R^2$	.0285	.0755	.0543	.0459	.0658	.0407	.0365	.0457
Standard error of regression	937.27	1091.10	1257.54	1329.29	1331.53	1294.15	1368.72	1470.77

<sup>1</sup>Numbers in parentheses are t-statistics. A coefficient is significant with at least a 95% level of confidence if its t-statistic is greater than or equal to 1.96.

<sup>2</sup>Explained in Section 4.5.

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Family File.

dropped from this portion of our analysis due to the small number of women in these age groups who actually worked and other difficulties encountered in obtaining meaningful statistical results.

Nothing yet has been said about the final variable included in both the offered wage and hours of work equations. This variable,  $\lambda$ , is included to control for the fact that we cannot observe the offered wage rates for jobs that women turn down.

Suppose that 100 wives who are similar in terms of the variables included in this analysis were each offered a job at a different wage rate. If we had data on all 100 of these wage offers we could easily calculate the mean offered wage for wives of this type. Suppose, however, that we only have wage data for, say, 42 wives who actually accepted the jobs offered to them. Now the mean wage for these 42 wives who accepted their job offers will be a reasonable estimate of the mean for all 100 offered wages only if there are no factors affecting both the wage offer received by each wife and her own asking wage. This seems unlikely. For instance, if there is a tendency for wives who receive the lower offered wages to have asking wages above the mean for wives of this type, then the mean observed wage rate for those wives who actually accept job offers will be higher than the mean wage for all job offers actually made to wives of this type.

$\lambda$  is a variable that has been estimated for each wife on the basis of our probit equations shown in Table 2.10. The less likely it is found to be, based on our probit analysis, that a particular wife will work, the larger the value of  $\lambda$  for this wife. If it is true that wives with below-average offered wages have above-average asking wages, after controlling for the systematic effects of the variables included in our analysis, then the sign of the coefficient of  $\lambda$  in the offered wage function should be negative. If the opposite relationship holds, then the sign of  $\lambda$  in the offered wage function should be positive. Theory and casual observation do not lead to any clear consensus on which of these scenarios represents reality.

In the case of the hours of work equation, however, the model we have developed and statistical theory clearly indicate that the sign of the coefficient of  $\lambda$  should be positive for all age groups. In this case, the coefficient of  $\lambda$  is supposed to be an estimate of a standard deviation. If our estimation results were to

turn up one or more significantly negative coefficients for  $\lambda$  in the hours of work equation, this would raise serious doubts about the model underlying these results.<sup>8</sup>

Looking now at Tables 4.9 and 4.10, we find that our estimation results support the hypotheses that have been advanced, with the following exception. The coefficient of the provincial unemployment rate is not significant at a 95% level of confidence in the offered wage equation for any of the eight age groups for which results are shown in Table 4.9, except for the 20-24 age group for which it is positive. It is, however, negative and significant at a 90% level of confidence for the 50-54 age group.

Also the significantly negative coefficients of the offered wage rate variable in the hours equation (Table 4.10) come as a surprise, since Heckman (1976) finds that, for wives in the United States aged 30-44, changes in the offered wage rate have a positive impact on the hours of work. Our finding, however, is in line with historical experience for Canada. While real wages for women and the female labour force participation rate both appear to have risen substantially,<sup>9</sup> the percentage of all female workers working 40 weeks per year or more has fallen from 74.4% in 1961 to 67.0% in 1971 and the percentage of female workers working 35 hours per week or more has fallen from 90.0% in 1951 to 81.7% in 1961 to 71.3% in 1971.<sup>10</sup>

The model and estimation techniques used in this chapter and Chapter 2 are discussed in more technical terms in Appendix B.

#### 4.5. The Explanatory Power of Our Results, and an Analysis of the Labour Force Responses of a Hypothetical Wife

The annual earned income of a wife equals her hourly wage rate multiplied by her annual number of hours worked. Thus, factors will tend to increase, or decrease, a wife's earned income depending on whether they increase, or decrease, her offered wage or her hours of work. Table 4.11 summarizes the results of our findings on the sign of the impact of each of the variables considered in this analysis.

How reliable are the results that have been presented? Is it reasonable to draw any conclusions from these results? It seems important to ask these questions

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See footnote(s) on page 115.

TABLE 4.11. Summary of Our Findings About Factors Affecting the Offered Wage, Hours of Work, and Earned Incomes of Working Wives

Explanatory variables	Expected sign of impact		
	Log of offered wage equation	Hours of work equation	Earned income of wife
1. Log of wife's offered wage		-	?
2. Years of education	+	+	+
3. Number of children less than six years of age	-	-	-
4. Number of children 6-14 years of age		-	-
5. Product of numbers of children less than six and 6-14 years of age		+	+
6. Number of children 19-24 years of age attending school full- or part-time		+	+
7. Number of children ever born		-	-
8. Employment income of husband		-	-
9. Asset income of family		-	-
10. Employment income of husband plus asset income of family divided by number of persons in family		+	+
11. Age of wife at first marriage	+		+
12. Dummy variable set equal to 1 if religion of wife is Roman Catholic and equal to 0 otherwise		+	+
13. Dummy variable set equal to 1 if language of home is French, and equal to 0 otherwise		-	-
14. Provincial unemployment rate	?		?
15. Local opportunity for jobs index	+		+

in the light of the low  $R^2$ 's and pseudo  $R^2$ 's for the model shown in Table 2.10 and in Tables 4.9 and 4.10.

The pseudo  $R^2$ 's for the model shown in Table 2.10 for the estimated probabilities that a married woman will work range from a high of 0.3623 to a low of 0.0799. The  $R^2$ 's shown in Table 4.9 for our equation for the log of a wife's offered wage range from a high of 0.3421 to a low of 0.1049. And the  $R^2$ 's shown in Table 4.10 for our equation for a wife's annual hours of work range from a high of 0.0755 to a low of 0.0285. The  $R^2$  is often interpreted as the percentage of the variation in the dependent variable that is explained by the estimated relationship. It can also be interpreted as the square of the simple correlation coefficient between the actual and estimated values of the dependent variable. Looked at either way it is apparent that our estimated equations for the probability that a wife will work, for the log of a wife's offered wage rate, and for a wife's annual hours of work explain very little about the labour force experience of any individual married woman.

This is to be expected since we do not have specific data on many of the factors, such as area of training, previous experience in the labour force, and health, that have important effects on the lifetime career patterns of individual women. We have included variables for a wife's age, years of education, age at first marriage and so forth, however, which on average should capture some of the differences in labour force behaviour between wives with different values of these variables.

To check the extent to which our estimated relationships explain the observed average behaviour of groups of married women of different types, we have first used the relationships shown in Table 2.10 to predict whether or not each married woman in our data sample did or did not work in 1970. We then grouped these women according to the categories shown in Table 4.12,<sup>11</sup> and computed the estimated and actual proportions of working wives in each of the 3,600 groups. We now regressed the estimated proportions on the actual proportions. Generalized least squares regression was used because the 3,600 groups do not all contain the same number of observations.<sup>12</sup> The grouped  $R^2$  calculated in this manner is 0.9072. Thus the estimated relationships shown in Table 2.10 explain approximately 91% of the variation among the groups shown in Table 4.12 in the proportions of wives working.

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See footnote(s) on page 115.

TABLE 4.12. Variables by Which Wives Were Cross-classified for  
Calculation of Grouped  $R^2$ s

For probability of working	For offered wage, annual hours of work and annual income
Age:	Age:
1. 15-24	1. 20-24
2. 25-34	2. 25-34
3. 35-44	3. 35-44
4. 45-64	4. 45-59
5. 65+	
Education:	
1. Less than 12 years	
2. Complete high school	
3. Bachelor or first professional degree	
Number of children:	
1. No children less than 14 years of age	
2. Children less than six years of age only	
3. Children 6-14 years of age only	
4. Both children less than six and children 6-14 years of age	
Earned income of husband plus family asset income:	
1. Less than \$3,000	
2. \$3,000-\$5,999	
3. \$6,000-\$8,999	
4. \$9,000-\$11,999	
5. \$12,000-\$14,999	
6. \$15,000+	
Residence:	
1. Urban	
2. Rural	
Region:	
1. Maritimes	
2. Quebec	
3. Ontario	
4. Prairies	
5. British Columbia	

Likewise we used the relationships shown in Table 4.9 to calculate an offered wage for each of the wives in our data sample who worked in 1970. We grouped these women according to the categories shown in the second column of Table 4.12, and computed the mean estimated wage rate for the wives in each of our 2,880 groups. (The number of groups is smaller because, as can be seen from Table 4.12, we now have fewer age categories.) We now regressed the estimated on the actual mean wage rates, again using generalized least squares. The grouped  $R^2$  calculated in this manner is 0.7307. Thus the estimated relationships shown in Table 4.9 explain approximately 73% of the variation among the groups shown in Column 2 of Table 4.12 in the mean wage rate.

Using the estimated wage rates already calculated for each wife who worked in 1970 and the relationships shown in Table 4.10, we now calculated an estimate of the annual number of hours worked by each of the wives in our data sample who earned employment income in 1970. We grouped these women again according to the same categories used in calculating the grouped  $R^2$  for the wage rate, and computed the mean estimated annual number of hours worked for the wives in each of our 2,880 groups. We now regressed the estimated on the actual mean numbers of hours worked, using generalized least squares. The grouped  $R^2$  calculated in this manner is 0.9294. Thus the estimated relationships shown in Table 4.10 explain approximately 92% of the variation among our groups in the mean annual number of hours worked.

Finally we multiplied the estimated wage rate for each wife who earned employment income in 1970 times the estimated number of hours she worked to obtain her estimated annual earned income. We again grouped these women according to the same categories used in calculating the grouped  $R^2$ s for the wage rate and the annual number of hours worked. The mean estimated annual income was now computed for the wives in each of our 2,880 groups. We regressed the estimated on the actual mean incomes using generalized least squares, and obtained a grouped  $R^2$  of 0.6254. Thus the estimated relationships for the offered wage rate and the annual number of hours of work shown in Tables 4.9 and 4.10 respectively explain approximately 62% of the variation among our 2,880 groups in the mean annual income.

Our estimation results indicate that variables under the control of individual wives, or these wives and their families, do have a substantial impact on the labour force behaviour and earned incomes of these wives. Consider a hypothetical 41-year-old wife living in a small city in New Brunswick with three children aged

four, 13 and 16, and a husband whose earned income is \$8,400. Assume that the asset income of the family is \$373 per year, the wife was 21 years old when she got married, and she has completed nine years of formal education. Our estimated relationships predict that this wife has a 30.5% probability of working, and that if she does work she will earn \$2.34 per hour, work 2,051 hours per year, and have an annual income of \$4,810.<sup>13</sup>

Suppose now that this wife had stayed in school three more years and completed her high school education, everything else remaining the same of course. Then our equations predict she would have a 37.1% probability of working, an hourly wage of \$3.01, a work year of 1,902 hours and an annual income of \$5,735. Or suppose that the birth of the third child had been prevented through improved use of contraceptives, a vasectomy or tubal ligation, or an abortion. Now the wife's expected probability of working would be 43.2%, her expected hourly wage rate would be \$2.83, her expected work year would be 2,150 hours and her expected annual income would be \$6,087. Or suppose that this family moved to a city with a population of 30,000 or over in Ontario, with the husband's income and everything else remaining unchanged. The 1970 unemployment rate in Ontario was 4.3% compared with 8.0% for New Brunswick. Also the 1970 value of our local opportunity for jobs index for large cities in Ontario is 0.49 compared with 0.39 for New Brunswick. In this more favourable labour market the wife's expected probability of working, wage rate, work year and annual income would be 42.9%, \$2.83, 1,889 hours and \$5,346, respectively.

For wives who cannot move, of course, local labour market conditions are givens that can only be altered through direct government spending, legislation, court rulings or economic growth. Suppose the coefficient of the variable for the number of children less than six years of age in the asking wage function were reduced in size by 20% through government subsidies to daycare, tax credits for childcare expenses, or reduced regulation of private daycare. Now our New Brunswick wife would be expected to have a 33.4% probability of working, a wage rate of \$2.47, a work year of 2,077 hours and an annual income if she works of \$5,129. Or suppose that the constant term in our function for the log of the offered wage was exogenously increased by 0.1823 through equal pay legislation designed to eliminate wage discrimination on the basis of sex. Now we would expect this same wife to have a

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See footnote(s) on page 115.

probability of 39.4% of working, a wage rate of \$3.28, a work year of 1,855 hours and an annual income of \$6,079.<sup>14</sup>

Another legislative or judicial happenstance might be quotas for women by occupation, designed to eliminate occupational barriers to entry on the basis of sex. Barriers to entry are obviously not the only reason for the presently observed occupational segregation of women workers. Nevertheless, to take an extreme example, suppose it were required that 50% of the jobs in all occupations be held by women, and, unrealistically, that this could be accomplished without any change in the unemployment rate. Then the value of our opportunity for jobs index for small cities in New Brunswick would rise from 0.39 to 0.54. If the employment income of her husband and everything else remained unchanged, we would now expect our New Brunswick wife to have a probability of 42.1% of working, a wage rate of \$2.97, a work year of 1,875 hours and an annual income of \$5,574.

Economic growth has tended to be ignored by researchers and government policy-makers as a major factor affecting the labour force behaviour and earned incomes of women.<sup>15</sup> Nor has the impact of differential patterns of economic growth received much attention from the women's liberation movement. Taking another extreme example however, our estimation results indicate that if New Brunswick were to succeed in doubling the total number of jobs available in small cities in the province in Clerical, Sales and Service occupations, the corresponding value of the local opportunity for jobs index would rise from the observed value of 0.39 to 0.60. The result would be that we would expect our hypothetical 41-year-old wife to have a probability of working of 47.2%, a wage rate of \$3.27, a work year of only 1,805 hours and an annual income if she works of \$5,900. Thus substantial improvement in both the probability of working and the accompanying monetary rewards can be obtained within the existing structure of occupational segregation through economic growth. Not just any type of growth will produce these results, however. Suppose that this same unrealistically large number of new jobs were created in small cities in New Brunswick in the Construction occupation rather than Clerical, Sales, and Service occupations. Now the value of our local opportunity for jobs index would still be 0.39 to two significant places, and the expected labour force behaviour and potential annual income of our New Brunswick wife would remain virtually unchanged. Economic growth is not sex-neutral.

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See footnote(s) on page 115.

Finally economic conditions beyond the control of a wife or her family may also indirectly affect her labour force behaviour and earned income through their impact on the earned income of her husband. Suppose that due to layoffs or strikes the husband of our hypothetical wife earned only \$6,400 instead of \$8,400. Now we would expect this wife to have an increased probability of working of 32.6%, a wage rate of \$2.44, an increased work year of 2,094 hours and an annual income of only \$5,110. The family's total income, based on the husband's earned income, the wife's earned income and family asset income would be \$11,883 compared to the original family income of \$13,583.

Thus there would appear to be a basis for the complaint that some poor and minority women have lodged against the women's movement and government programs for women that, while more well-to-do women decry the dearth of stimulating or well-paying jobs open to women, less fortunate wives are often compelled to work because of the scarcity and instability of the job opportunities open to poorly educated, unskilled men. It is not that women are "taking away" jobs from these men. At this end of the education-skill ladder there is still little direct competition between male and female job seekers. However, both the wives who want better job opportunities, daycare, judicial protection and so forth for themselves, and the wives who want more jobs, new training programs, and other measures that would increase the incomes their husbands can earn are indirectly competing for scarce government funds, political initiatives and public sympathy.

Of course, large-scale government programs would also have a substantial secondary impact through changes in the macro economy which cannot be explored using a model that treats economic changes outside the labour market for married women as exogenous. The model presented, however, would allow a policy maker to determine whether any specific government program designed to improve labour market conditions for women would have its major impact on the number of hours worked by women or on their wage rates; and policies affecting both micro and macro variables can be compared, at least in terms of their expected initial impacts.

#### FOOTNOTES

<sup>1</sup>In Tables 4.1 and 4.2, the 1951 data are based on employed wage and salary earners 14 years of age and older who reported wages and salaries received during the previous 12 months. The 1961 data are for wage and salary earners 15 years of age and older in the labour force. The 1971 data are based on wage earners 15 years of age and over in the labour force with positive income from wages and salaries in 1970. The 1951 data are reported in the published tables as numbers of individuals earning wage and salary incomes within specified ranges, such as less than \$500, \$500-\$999, and so on. Weighted averages were calculated by taking the upper boundary of the lowest category (less than \$500), the lower boundary of the highest category (more than \$4,000), and the mid-points of all other categories. The 1961 published tables report the average wage and salary earnings of wage and salary earners. The 1971 published tables do not include wage and salary income by industry or occupation; these data were therefore calculated from the Individual File of the Public Use Sample.

<sup>2</sup>1971 Census of Canada, Vol. III - Part 1, Table 39, gives averages for all persons with wage and salary income of \$5,683 for both sexes and \$3,543 for women. The differences between our totals and these are probably due to sampling differences.

<sup>3</sup>In addition, the data for 1951 refer to employed wage earners, while the data for 1961 and 1971 are for wage earners in the labour force.

<sup>4</sup>The occupational data in the 1951 tables are not sufficiently detailed to permit reclassification.

<sup>5</sup>The 1961 data are for wage and salary earners in the labour force reporting the number of weeks for wages and salaries. There is no way of extracting occupational and industrial data for only wage and salary earners from the published tables for 1971. Thus, for this year, the Individual File of the Public Use Sample was used to compute data on total weeks worked in 1970 for wage and salary earners in the labour force who reported positive income from wages and salaries in 1970.

<sup>6</sup>Thus the sample of wives for which results are presented in Section 4.4 includes all wives for whom the true value of our dummy dependent variable was 1 in our probit analysis for which results are reported in Section 2.5 of Chapter 2.

<sup>7</sup>For each wife who worked in 1970, we calculated her annual hours worked by multiplying the mid-point for the relevant category (1-13, 14-26, 27-39, 40-48, 49-52) for the number of weeks worked during 1970 times the mid-point for the relevant category (1-19, 20-29, 30-34, 35-39, 40-44, 45-49, 50 or more, where this top category was actually assigned by us a value of 50) for the usual number of hours worked each week at the job held in the week prior to enumeration, or else at the job of longest duration since 1 January 1970. The offered wage rate was then computed by dividing the total employment income of the wife for 1970 by the figure computed for her annual hours of work in 1970. The actual employment income of the wife for 1970 is given on the Family File of the Public Use Sample for values up to and including \$24,999 for the Atlantic region, and for values up to and including \$49,999 for all other regions. Incomes in excess of these regional maximums are given as \$25,000 and \$50,000, respectively. The functional forms we have adopted were also used by Heckman (1976).

<sup>8</sup>See Heckman (1976) and Appendix B for more information on the definition and interpretation of the selection bias term.

<sup>9</sup>This does not mean, of course, that the relative wage rates of women compared with those of men have been rising (see Meltz, 1965, pp. 61-68).

<sup>10</sup>See Tables 4.4 and 4.6 in Section 4.2. It should also be noted that other researchers have found the response of the hours worked to a change in the offered wage rate to be negative for men (see, for instance, Finegan, 1962; Owen, 1971; and Kniesner, 1976).

<sup>11</sup>These categories are essentially the same as the categories used by Gunderson (1976).

<sup>12</sup>See Pindyck and Rubinfeld (1976, pp. 97-98) for a more complete discussion of the use of generalized least squares.

<sup>13</sup>Canadian wives aged 40-44 at the time the 1971 Census was taken had on the average 0.3 children less than six years of age, 1.5 children 6-14 years of age, 0.2 children 19-24 years of age attending school full- or part-time, and 3.3 children ever born; were married to husbands with an average employment income of \$8,252.70 and lived in families with an average asset income of \$371.50; married on the average at 23 years of age; and lived in places of residence with an average provincial unemployment rate of 5.9% and an average value of our local opportunity for jobs index of 0.41.

<sup>14</sup>Calculation of this estimate depends on the computation of a (non-unique) value for  $\sigma$  (see Equation 36 in Appendix B for a definition of  $\sigma$ ). The estimate of  $\sigma$  used in this case ( $\sigma = 0.770$ ) was obtained from the probit and offered wage coefficients of the education variable for the age group 40-44. The constant term in our function for the log of the offered wage was increased by 0.1823 in order to raise the wage rate for our hypothetical wife approximately 20% of the distance between the mean wage rate for working wives in her age group and the mean wage rate for the husbands of these working wives (see Table 4.7).

<sup>15</sup>This is not to say that we are the first to notice the potential importance of economic growth factors (see, for instance, Fuchs, 1974; and Meltz, 1975).



## CHAPTER 5

### IMPLICATIONS OF THE LABOUR FORCE BEHAVIOUR OF CANADIAN WIVES

#### 5.1. Introduction

As noted in the introduction to this monograph, much of the interest in the increased labour force participation of married women stems from speculation that the labour force behaviour of wives may affect other aspects of family life as well. In this chapter we will briefly examine some of the implications of the labour force behaviour of Canadian wives with respect to (a) family characteristics of wives who work, (b) family income distribution, and (c) home ownership and the ownership of vacation homes and durable goods.

Some caution must be exercised throughout this chapter in interpreting our results in a causal sense. It is generally difficult to discern whether the observed differences in family behaviour result from differences in the labour force behaviour of different wives, or if both the labour force behaviour of wives and other associated differences in family behaviour are caused by more basic differences in tastes and circumstances. If the latter is true, then the entry of more women into the labour force in future years may not result in a magnification of the behaviour patterns we now observe for families where the wives work - unless, of course, these new working wives enter the labour force because the tastes and circumstances presently motivating wives to work have spread.

Even with the family income distribution, both the direction of causation and the probable impact of a continued influx of wives into the labour force are difficult to discern. Our work suggests that the labour force behaviour of wives affects the family income distribution through changes in both the supply of workers and levels of demand for goods and services, while the family income distribution in turn affects the labour force behaviour of wives through the impact of this distribution on the incomes of the husbands of these wives. This means, for instance that when we examine the distribution over families of various components of family income, it must be borne in mind that if all wives actually quit working, labour market conditions would change, resulting in secondary changes in the distributions of the incomes of the husbands too.

### 5.2. The Family Characteristics of Wives Who Work

In Chapters 2 and 3 we found that the more small children a wife has, the less likely it is she will work.<sup>1</sup> Yet by 1971, working wives with small children were far from a rarity. From Table 5.1 we see, for instance, that in 1971 32.4% of the wives 20-49 years of age in husband-wife families earned employment income in 1970 and had at least one child under six years of age.<sup>2</sup>

TABLE 5.1. Wives 20-49 Years Old in Husband-Wife Families Who Earned Employment Income in 1970, by Number of Children Less Than Six Years of Age, Canada

Number of children less than six years of age	Number of wives	Percentage distribution of wives
0	861,500	67.6
1	307,200	24.1
2	93,400	7.3
3 or more	12,300	1.0

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Family File.

Not all these wives worked full time, of course. In fact, in Chapter 4 data are presented that suggest that the percentage of women wage earners working less than 35 hours per week, and the percentage working less than 40 weeks per year, have been increasing over the period 1951-71.<sup>3</sup> Nevertheless from Table 5.2 we see that 80.0%, 70.2% and 74.8% of wives 20-49 years of age in husband-wife families who earned employment income in 1970 and who had one, two, or three or more children younger than six, respectively, usually worked 20 hours per week or more. Moreover, among these same wives classified by whether they had one, two, or three or more children younger than six, we see that 57.3%, 46.8% and 47.1%, respectively, worked 27 weeks or more in 1970.

In Chapters 2 and 4 we found that wives are more likely to work, and tend to work longer hours if they do work, when the husband's income is low and the family has little or no asset income. We also found that wives with low wage rates

See footnote(s) on page 135.

have a tendency to work longer hours.<sup>4</sup> In Table 5.2 we see some of the implications of these tendencies. After adjusting for federal and provincial taxes we find that, for the wives in Table 5.2 with one, two, or three or more children younger than six, 52.1%, 52.8% and 56.9%, respectively, earned less than \$2.00 per hour in 1970. In terms of after-tax family income we find that 75.1%, 79.8% and 83.7% of these wives, respectively, were in families with combined totals of the husband's and wife's employment incomes plus family asset income of \$10,000 or less in 1970.<sup>5</sup>

These figures should be borne in mind by those seeking to up grade standards, and hence raise costs in daycare centres; and by those seeking to explain why the percentage of working wives with small children who use formal daycare has remained so low. Even fairly low-quality formal daycare programs may offer socialization opportunities and minimal levels of physical safety for the children involved, as well as operational stability, not necessarily present in informal childcare situations.<sup>6</sup> For families where both parents work, higher childcare costs clearly mean that one or both parents must work longer hours, and hence have less time to spend at home; or alternatively that other things that families want, such as family vacations, better housing and so forth, must be sacrificed.

Working parents, like all others operating on limited budgets, must choose which goods and services they feel will most help their children as individuals and as members of a family. Nor should it necessarily shock the public at large that some of these choices have clear implications for the health, safety and development of the children involved. Within the bounds of broad guidelines laid down by society, families where the mother does not work make dollar-and-cent choices of this sort everyday.

### 5.3. The Impact of the Earnings of Wives on the Family Income Distribution

Wives are not usually the primary breadwinners in their families. They are often classified as secondary workers in policy and research papers addressing labour force issues. And yet the incomes of working wives have an important direct impact on both the standard of living enjoyed by individual families and the overall family income distribution. Moreover the nature of the impact depends on which wives earn which levels of income.

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See footnote(s) on page 135.

TABLE 5.2. Wives 20-49 Years Old in Husband-wife Families Who Earned Employment Income in 1970, by Number of Children Less Than Six Years of Age and Selected Other Characteristics,<sup>1</sup> Canada

Item	Number of children less than six years of age			
	0	1	2	3 or more
<u>Hours worked per week</u>				
Less than 20	13.4	20.0	29.8	25.2
20 - 39	44.9	40.0	35.0	34.1
More than 39	41.7	40.0	35.2	40.7
<u>Weeks worked per year</u>				
Less than 27	22.1	42.7	53.2	52.8
27 - 48	25.8	27.1	24.0	26.8
More than 48	52.1	30.2	22.8	20.3
<u>Hourly wage rate after tax</u>				
Less than \$1.00	11.4	14.3	19.1	26.0
\$1.00 - 1.99	44.8	37.8	33.7	30.9
\$2.00 - 2.99	26.0	23.5	21.0	17.9
\$3.00 - 3.99	8.1	10.0	9.7	9.8
\$4.00 or more	9.7	14.4	16.5	15.4
<u>Family income after tax</u>				
Less than \$5,000	9.5	12.8	16.3	15.4
\$5,000 - 10,000	55.0	62.3	63.5	68.3
More than \$10,000	35.5	24.9	20.2	16.3
<u>Number of children ever born</u>				
Less than four	83.8	86.3	85.0	56.9
Four or more	16.2	13.7	15.0	43.1

<sup>1</sup> For each characteristic, such as "Hours worked per week", the percentage figures sum to 100.0% for each category of the number of children less than six years of age.

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Family File.

More educated women tend to marry more educated, higher-income men. All other factors being equal, we know from Chapters 2 and 4 that wives in families where the employment income of the husband, and perhaps asset income as well, is high are less likely to work, and tend to work fewer hours if they do work.<sup>7</sup> All other factors are not equal, however. More educated wives, and wives married to more educated and higher-income men, tend to have fewer children.<sup>8</sup> This leads to higher probabilities of working, and longer hours of work on the average for those wives who do work.<sup>9</sup> Moreover, wives with more education tend to earn more per hour all other factors being equal.<sup>10</sup> On the average then, do the employment incomes of wives tend to increase or decrease the inequality of the family income distribution in Canada?

In order to examine this question, for each of the five regions of Canada (the Maritimes, Quebec, Ontario, the Prairies and British Columbia) and for several components of before-tax family income, we have computed statistics called "Gini coefficients". Before examining these results, we will first briefly explain what Gini coefficients are.<sup>11</sup>

In the third column of Table 5.3 we show the actual cumulative percentages of income received by the corresponding cumulative percentages of husband-wife families in Canada in 1970. The income figures used in computing the percentages shown in Table 5.3 are found for each family by adding the 1970 employment income of the husband plus family asset income plus the employment income of the wife.<sup>12</sup>

The points corresponding to the percentages shown in Table 5.3 are plotted in Chart 5.1, and the line connecting these points is called the "empirical Lorenz curve" for family income in Canada in 1970. This curve can be compared with the Lorenz curves corresponding to the extremes of complete income equality and complete inequality. If all families had equal incomes, the corresponding Lorenz curve would be the 45° line. On the other hand, if all families had no income, except for one which had all the income, then the corresponding points defining the Lorenz curve would all lie along the horizontal axis with the exception of the last point for the family with all the income. This last point would have the co-ordinates of (1.0, 1.0). Thus, in general, the Lorenz curve for any component of family income is found by first ordering families by the size (from smallest to largest) of this

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See footnote(s) on page 135.

component of their incomes, and then plotting the cumulative percentages for this component of income against the cumulative percentages of families.

TABLE 5.3. Cumulative Income Distributions

Cumulative percentages of husband-wife families	Cumulative distributions of income		
	Absolute equality	Absolute inequality	Actual 1970
0	0	0	0
20	20	0	4
40	40	0	17
60	60	0	35
80	80	0	59
95	95	0	85
100	100	100	100

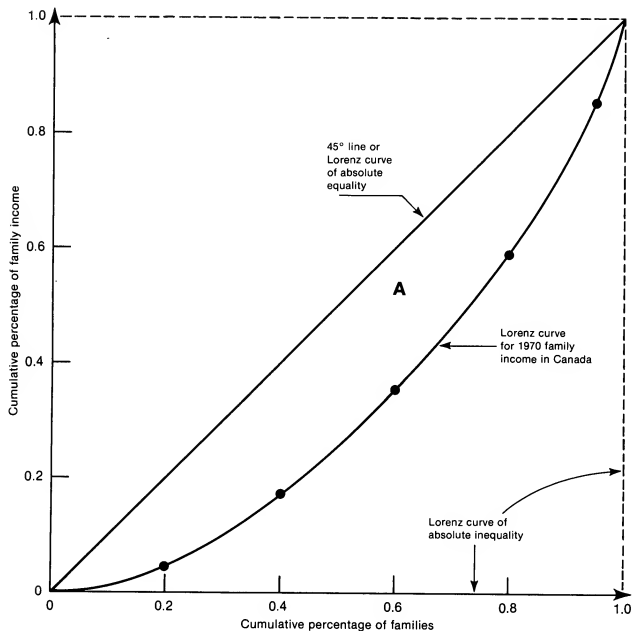
Source: The cumulative percentages for family income in Canada (including income of the husband, the income of the wife and family asset income) are based on 1971 Census of Canada, Public Use Sample Tape - Family File.

The area between the Lorenz curve and the 45° line will be zero when every family has the same income, half when only one family has all the income, and will be between zero and one half when the Lorenz curve lies between the curve corresponding to absolute equality and the curve corresponding to absolute inequality. The latter is generally the case. If we call the area between the Lorenz curve and the 45° line A, then the Gini coefficient is simply 2A. Thus a Gini coefficient of zero corresponds to the case of absolute equality. A Gini coefficient of one corresponds to the case of absolute inequality. And the Gini coefficients for most real income distributions will be in between these two extremes.

In order to judge the impact of the employment incomes of working wives on the family income distribution it is necessary first of all to look at the distribution of family income excluding the employment incomes of these wives. The mean employment incomes for husbands 15-24, 25-34, 35-44, 45-64 and 65 years of age and older are shown in Line 1 of Table 5.4 for the Maritimes, Quebec, Ontario, the Prairies and British Columbia. For all five regions the mean employment incomes of husbands rise until the 35-44 age group, and then fall with increasing age. The mean employment incomes of husbands are always highest in Ontario, the Prairies and

Chart 5.1

The Empirical Lorenz Curve for Family Income in Canada, 1970



British Columbia, and lowest in the Maritimes, with the mean employment incomes of husbands in Quebec falling in between.

Looking now at the corresponding Gini coefficients shown in Line 2 of Table 5.4, we find that for each region the value of the Gini coefficient falls from the 15-24 to the 25-34 age group, and then rises steadily with increasing age. For most age groups, the distribution of the employment income of the husband is most equal in Ontario and British Columbia, and least equal in the Maritimes.

The mean family asset incomes are shown in Line 11 of Table 5.4. The mean asset incomes of families rise steadily for each region as the ages of the husbands increase. These means are generally highest for Ontario, the Prairies and British Columbia, and are always lowest in the Maritimes. Thus the distribution of asset income among families tends to offset the decline in the upper age brackets in the earned incomes of husbands. However, it reinforces regional disparities. These two effects can be seen by looking at the means and the corresponding Gini coefficients shown in Lines 4 and 5 of Table 5.4 for the combined employment income of the husband and family asset income. The rankings of the means and Gini coefficients by regions within each age group are essentially identical to the corresponding rankings for the employment income of the husband considered alone. However, the degree of inequality within regions is markedly less in the two older age groups for the combined employment income of the husband and family asset income than for the employment income of the husband only.

Finally the means for the employment income of the wife are shown in Line 13 of Table 5.4. These means fall steadily for each region as the age of the husband increases. Thus the distribution of the employment income of the wife tends to offset the low earned incomes of husbands in the lower age brackets. The mean employment incomes for wives are highest for Quebec, Ontario and the Prairies for wives with husbands 15-24 and 25-34 years of age; and for Ontario, the Prairies and British Columbia for all the upper age groups. The lowest mean is always for the Maritimes, except for wives whose husbands are 65 and older. For wives whose husbands are 65 and older, the lowest mean is for Quebec and the next lowest is for the Maritimes. Thus, like asset income, the distribution of the employment income of the wife reinforces the regional disparities inherent in the distribution of the earned income of the husband.

TABLE 5.4. Characteristics of the Family Income Distribution by Age of Husbands, Regions of Canada, 1971

	Husbands 15-24 years of age				
	Maritimes	Quebec	Ontario	Prairies	British Columbia
1. Means of employment income of husbands	4264.81	4860.99	5414.36	9949.46	5466.71
2. Gini coefficients for employment incomes of husbands	.329	.284	.284	.300	.281
3. Means of the combined employment incomes of husbands and family asset income	4302.48	4922.90	5479.25	5028.98	5532.1
4. Gini coefficients for the combined employment incomes of husbands and family asset incomes	.327	.285	.281	.297	.284
5. Means of family income <sup>1</sup>	5522.84	7196.86	7658.75	6926.37	7295.73
6. Gini coefficients for family incomes	.337	.268	.271	.291	.272
7. Means for per person family incomes <sup>2</sup>	2157.69	3107.37	3223.88	2944.21	3099.43
8. Gini coefficients for per person family incomes	.392	.323	.330	.339	.342
9. Means for weighted per person family incomes <sup>2</sup>	2375.90	3293.35	3451.30	3137.15	3304.66
10. Gini coefficients for weighted per person family incomes	.361	.295	.300	.313	.308
11. Means for family asset incomes	37.67	61.91	64.88	79.51	65.42
12. Gini coefficients for family asset incomes	.847	.912	.898	.869	.904
13. Means for employment incomes of wives	1220.36	2273.97	2179.50	1897.39	1763.61
14. Gini coefficients for employment incomes of wives	.691	.536	.541	.580	.624
15. Mean family sizes	2.91	2.53	2.61	2.58	2.62
16. Mean number of children less than six years of age	0.87	0.52	0.58	0.56	0.60
17. Mean number of children 6-14 years of age	0.03	0.01	0.03	0.01	0.01
18. Mean number of children ever born	0.92	0.54	0.65	0.65	0.67

See footnote(s) at end of table.

TABLE 5.4. Characteristics of the Family Income Distribution by Age of Husbands, Regions of Canada, 1971 - Continued

	Husbands 25-34 years of age				
	Maritimes	Quebec	Ontario	Prairies	British Columbia
1. Means of employment income of husbands	6205.23	7064.07	8048.29	7575.29	8124.64
2. Gini coefficients for employment incomes of husbands	.303	.283	.259	.299	.262
3. Means of the combined employment incomes of husbands and family asset income	6291.73	7216.00	8226.35	7691.36	8313.68
4. Gini coefficients for the combined employment incomes of husbands and family asset incomes	.304	.285	.260	.299	.261
5. Means of family income <sup>1</sup>	7407.89	8818.59	10161.54	9246.66	9742.90
6. Gini coefficients for family incomes	.304	.285	.254	.284	.258
7. Means for per person family incomes <sup>2</sup>	2222.68	2907.93	3276.15	2860.01	3056.03
8. Gini coefficients for per person family incomes	.397	.367	.352	.381	.352
9. Means for weighted per person family incomes <sup>2</sup>	2695.49	3406.53	3862.45	3423.24	3638.43
10. Gini coefficients for weighted per person family incomes	.352	.325	.304	.332	.304
11. Means for family asset incomes	86.50	152.30	179.20	176.07	189.04
12. Gini coefficients for family asset incomes	.903	.927	.892	.973	.884
13. Means for employment incomes of wives	1116.17	1603.31	1935.02	1555.30	1429.22
14. Gini coefficients for employment incomes of wives	.763	.729	.662	.697	.737
15. Mean family sizes	3.95	3.54	3.62	3.76	3.72
16. Mean number of children less than six years of age	1.19	0.99	0.98	1.10	1.01
17. Mean number of children 6-14 years of age	0.79	0.55	0.64	0.66	0.71
18. Mean number of children ever born	2.05	1.56	1.65	1.77	1.74

See footnote(s) at end of table.

TABLE 5.4. Characteristics of the Family Income Distribution by Age of Husbands,  
Regions of Canada, 1971 - Continued

	Husbands 35-44 years of age				
	Maritimes	Quebec	Ontario	Prairies	British Columbia
1. Means of employment income of husbands	6541.38	8160.63	9537.58	8274.41	9395.98
2. Gini coefficients for employment incomes of husbands	.367	.326	.296	.338	.279
3. Means of the combined employment incomes of husbands and family asset income	6738.27	8440.33	9833.06	8605.05	9684.66
4. Gini coefficients for the combined employment incomes of husbands and family asset incomes	.372	.330	.297	.340	.278
5. Means of family income <sup>1</sup>	7442.41	9364.61	11329.74	9723.50	10818.12
6. Gini coefficients for family incomes	.363	.321	.282	.326	.262
7. Means for per person family incomes <sup>2</sup>	1585.49	2230.65	2721.82	2261.29	2650.22
8. Gini coefficients for per person family incomes	.416	.392	.351	.392	.234
9. Means for weighted per person family incomes <sup>2</sup>	2048.42	2818.00	3397.76	2843.59	3274.13
10. Gini coefficients for weighted per person family incomes	.396	.366	.324	.362	.303
11. Means for family asset incomes	196.89	280.38	297.07	330.64	288.68
12. Gini coefficients for family asset incomes	.951	.903	.883	.898	.890
13. Means for employment incomes of wives	704.14	924.31	1495.81	1118.44	1133.46
14. Gini coefficients for employment incomes of wives	.822	.833	.734	.774	.786
15. Mean family sizes	5.38	4.87	4.72	4.94	4.61
16. Mean number of children less than six years of age	0.75	0.55	0.54	0.59	0.51
17. Mean number of children 6-14 years of age	2.18	1.90	1.71	1.90	1.62
18. Mean number of children ever born	3.71	2.99	2.87	3.14	2.77

See footnote(s) at end of table.

TABLE 5.4. Characteristics of the Family Income Distribution by Age of Husbands, Regions of Canada, 1971 - Continued

	Husbands 45-64 years of age				
	Maritimes	Quebec	Ontario	Prairies	British Columbia
1. Means of employment income of husbands	5704.28	6907.32	8567.39	6935.48	8083.70
2. Gini coefficients for employment incomes of husbands	.424	.399	.345	.414	.335
3. Means of the combined employment incomes of husbands and family asset income	6131.33	7455.35	9311.71	7518.52	8929.83
4. Gini coefficients for the combined employment incomes of husbands and family asset incomes	.413	.391	.337	.406	.320
5. Means of family income <sup>1</sup>	6926.56	8340.87	10874.38	8779.67	10207.28
6. Gini coefficients for family incomes	.403	.383	.320	.387	.307
7. Means for per person family incomes <sup>2</sup>	2115.46	2414.34	3598.44	2848.28	3447.83
8. Gini coefficients for per person family incomes	.468	.449	.372	.440	.349
9. Means for weighted per person family incomes <sup>2</sup>	2263.04	2575.31	3772.31	3012.30	3636.09
10. Gini coefficients for weighted per person family incomes	.450	.433	.356	.423	.333
11. Means for family asset incomes	427.05	549.33	746.93	583.30	846.13
12. Gini coefficients for family asset incomes	.880	.872	.831	.834	.835
13. Means for employment incomes of wives	795.23	885.01	1561.00	1261.87	1277.45
14. Gini coefficients for employment incomes of wives	.827	.844	.730	.762	.768
15. Mean family sizes	4.11	4.21	3.51	3.66	3.37
16. Mean number of children less than six years of age	0.16	0.11	0.07	0.10	0.08
17. Mean number of children 6-14 years of age	0.94	0.84	0.55	0.71	0.56
18. Mean number of children ever born	3.78	3.58	2.76	3.18	2.71

See footnote(s) at end of table.

TABLE 5.4. Characteristics of the Family Income Distribution by Age of Husbands, Regions of Canada, 1971 - Concluded

	Husbands 65 years of age and older				
	Maritimes	Quebec	Ontario	Prairies	British Columbia
1. Means of employment income of husbands	1207.91	1587.96	2116.25	1627.03	1801.97
2. Gini coefficients for employment incomes of husbands	.827	.813	.761	.780	.798
3. Means of the combined employment incomes of husbands and family asset income	2346.76	3105.21	4122.30	2837.55	3768.61
4. Gini coefficients for the combined employment incomes of husbands and family asset incomes	.707	.655	.568	.632	.588
5. Means of family income <sup>1</sup>	2654.08	3378.37	4605.37	3331.90	4246.77
6. Gini coefficients for family incomes	.694	.649	.555	.608	.570
7. Means for per person family incomes <sup>2</sup>	1194.17	1445.73	2125.87	1522.77	1992.54
8. Gini coefficients for per person family incomes	.702	.650	.558	.608	.578
9. Means for weighted per person family incomes <sup>2</sup>	1195.66	1449.79	2133.07	1526.85	1999.80
10. Gini coefficients for weighted per person family incomes	.701	.649	.558	.608	.577
11. Means for family asset incomes	1138.85	1517.25	2006.06	1210.52	1966.63
12. Gini coefficients for family asset incomes	.796	.737	.664	.720	.676
13. Means for employment incomes of wives	307.32	273.16	483.07	494.35	478.16
14. Gini coefficients for employment incomes of wives	.919	.939	.901	.896	.894
15. Mean family sizes	0.01	0.01	0.01	2.27	2.18
16. Mean number of children less than six years of age	0.01	0.01	0.01	0.01	0.01
17. Mean number of children 6-14 years of age	0.06	0.04	0.03	0.04	0.03
18. Mean number of children ever born	3.71	3.81	2.61	3.29	2.57

<sup>1</sup> The composition of family income is the combined employment incomes of husbands, family asset incomes and employment incomes of wives.

<sup>2</sup> See footnote 13 for details of the computation of these income variables.

These effects can be seen in Lines 5 and 6 of Table 5.4. Line 5 shows the means of the combined employment income of the husband, family asset income and employment income of the wife; and Line 6 shows the corresponding Gini coefficients. Again the rankings of the means and Gini coefficients by regions within each age group are very similar to the corresponding rankings for the employment income of the husband alone. However, the degree of inequality within regions is generally less for the combined employment income of the husband, family asset income and employment income of the wife than for either the combined employment income of the husband and family asset income, or the employment income of the husband considered alone. This pattern persists for all age groups. Thus, despite the fairly extreme inequality of the distribution of employment income among wives,<sup>13</sup> the effect of this additional income on the combined family income distribution is generally to reduce its inequality.

#### 5.4. Working Wives and Family Expenditure Patterns

Given the obvious importance of the earnings of wives in terms of the income levels of their families, we were curious whether family expenditure patterns differ depending on how much of the total family income is earned by the husband and how much by the wife.<sup>14</sup> In this regard, we examined the decision to own a home,<sup>15</sup> monthly expenditures on housing for both owners and renters,<sup>16</sup> the size of the owned or rented dwelling in which a family lives,<sup>17</sup> and the ownership of vacation homes and a variety of durable goods. The details of these analyses are reported elsewhere. We will simply summarize the relevant findings here.<sup>18</sup>

Beginning with the question of home ownership, we find that a family is more likely to own their home the higher the husband's income. The relationship between home ownership and the income of the wife is found to be positive too, but much weaker.

We find that, for both owners and renters, the incomes of both the husband and wife have an important impact on family housing expenditures. We also find, however, that, looked at in either dollar or percentage terms, a \$1.00 increase in the income of the husband generally results in a larger increase in monthly housing

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See footnote(s) on page 135.

expenditures than a \$1.00 increase in the income of the wife. Owners where the husband is in the 20-29 age group are the exception to this rule.

Turning to the question of size, we find that in both percentage and per dollar terms the impact of the husband's earnings is stronger than the impact of the wife's earnings on the size of the housing unit in which the family lives. In fact, for renters it would appear that it is only the husband's income that systematically affects the size of the family's living quarters.

Finally we examined the impact of the earnings of the husband and the wife on the probabilities that a family that owns its own home will also own a vacation home, an automatic clothes dryer, an electric dishwasher, a home freezer or a colour television set. The earnings of both the husband and the wife are found to have a significant and positive impact on all these probabilities.

Looking at the relative magnitudes of the impact, however, we find little support for the commonly espoused notion that families where the wife works are more likely to own automatic household appliances than families with the same total income where the wife does not work. In fact, it is only the probabilities of owning a vacation home, a home freezer and a colour television set that we find to be affected more strongly by the earnings of the wife than by the earnings of the husband.

We see, therefore, that the earnings of wives affect not only the income levels of their families, but are also related to systematic differences in the ways in which families spend their incomes. Consider two families with the same level of total family income and with similar numbers and ages of children, place of residence and so forth. Suppose, however, that in one family the whole of the family income is earned by the husband, while in the other some portion of the family income is earned by the wife.

We would attach a lower probability to the likelihood of the two-paycheque family owning a house. And if they do own a house, we would expect their associated monthly expenditures on housing to be smaller, and their house itself to be smaller, than in the case of the family where the wife does not work. Likewise, if both families rent, we would expect the gross rent of the two-paycheque family to be

lower. If both families own their home, our results show that the family where only the husband works would be more likely to own an automatic clothes dryer or an electric dishwasher. The family where both spouses work, on the other hand, would be more likely to own a vacation home, a home freezer or a colour television set.

FOOTNOTES

<sup>1</sup> See Chapter 2, Section 2.5.

<sup>2</sup> The data base used in carrying out the calculations for Tables 5.1 and 5.2 is the same data base we used in Section 4.3 of Chapter 4 to examine factors affecting the offered wage rates and hours of work of married women, with the age groups 20-24 through 45-49 combined (see Chapter 4, Footnote 6 and Chapter 2, Section 2.4 for a description of this data base).

<sup>3</sup> See Chapter 4, Section 4.2.

<sup>4</sup> See Chapter 2, Section 2.5 and Chapter 4, Section 4.4.

<sup>5</sup> See Chapter 4, Footnote 7 for details of how we have computed each wife's hourly earnings from employment, and specifics concerning our data for the wife's 1970 employment income. See Chapter 2, Footnotes 18 and 19 for specifics concerning the employment income of the husband, the asset income of the family and income categories we have not included in these calculations.

In adjusting for provincial and federal income taxes we have closely followed the federal and provincial tax tables for 1970 (excluding Quebec) given in 1972 Taxation Statistics Analyzing 1970 T1 Individual Tax Returns and Miscellaneous Statistics, Department of National Revenue, Ottawa, 1972; and the Quebec income tax table for 1970 given in A.N. Gilmour's Provincial Income Tax Handbook, Toronto: Richard De Boo Ltd., 1968.

<sup>6</sup> Pressure groups frequently seem to push for raising standards for daycare with little or no attention to the growing body of research devoted to this topic. For instance, Carnegie Quarterly, Vol. XXV, No. 3, reports that, "new research indicates that our fears about average daycare programs are baseless: it shows that typical, not just ideal, daycare seems to have no ill effects ...".

<sup>7</sup> See Chapter 2, Section 2.5 and Chapter 4, Section 4.4.

<sup>8</sup>For further evidence concerning this point see Jacques Henripin, Trends and Factors of Fertility in Canada, Ottawa: Statistics Canada, 1972.

<sup>9</sup>See Chapter 2, Section 2.5 and Chapter 4, Section 4.4.

<sup>10</sup>See Chapter 4, Section 4.4.

<sup>11</sup>See Kendall and Stuart (1958) for a discussion of the method we have used to compute the Gini coefficients shown in Section 5.3.

<sup>12</sup>The data base used in carrying out the calculations for Tables 5.3 and 5.4 is the same data base we used in Section 2.4 and 2.5 to analyse factors affecting the probabilities of wives working, where this data base has been divided into new groups depending on the age of the husband. See Chapter 2, Section 2.4 for a description of this data base. For definitions and details concerning the various components of family income see Chapter 2, Footnotes 1, 18, and 19, and Chapter 4, Footnote 7.

<sup>13</sup>For all age groups it can be seen from Lines 2, 12 and 14 of Table 5.4 that the employment income of wives is more equally distributed among Canadian families than asset income, but less equally distributed than the employment income of husbands.

Also from Lines 8 and 10 of Table 5.4 we see that for all regions the distribution of children among families substantially increases the inequality of the family income distribution considered on a per person, or weighted per person, basis. Per person family income was computed for each family by dividing the combined earned income of the husband, the family asset income and the earned income of the wife by the number of persons in each family. Weighted per person family income was computed for each family in the same manner, except that we divided by the total number of persons in each family over 14 years of age plus half the number of persons in each family 14 years of age or younger. What we are doing, in other words, is giving adults a weight of one and children a weight of one half.

<sup>14</sup>Unfortunately, the Family File of the Public Use Sample, which has served as our main data source for the rest of this monograph, does not contain sufficient information on a family's housing status and its ownership of other assets to permit investigation of the questions posed in this section of this chapter. On the other hand, the Household File, which does contain a substantial amount of information on housing and other assets, does not contain any specific information on the labour force behaviour of the wife. The Household File does, however, contain a variable for total household income and another variable for the total income of the husband. The total income of the household is the sum of all income received by all members of a household, 15 years of age and over, during the 1970 calendar year. Actual figures are given up to and including \$99,999, with all incomes above this figure being given as \$100,000. For the total income of the husband, actual figures are given up to and including \$74,999, with all incomes above this figure being given as \$75,000.

By limiting our sample to one-family households with both parents at home and without additional persons not in the immediate family, we can calculate for each family the total income of all family members other than the husband. From the Family File we know that, for husband-wife families, wives make up only 29.4% of all family members, other than the husband, who have income. However, the total income of wives amounts to 69.7% of all this secondary income, and the employment income of wives is 85.9% of their total income. We have used the income of all family members other than the husband as a proxy variable for the income of the wife. Our income variables have been converted to a monthly basis by dividing by 12.

There are 35,086 husband-wife families with no relatives or non-relatives present living in non-farm places of residence on the Household File of the Public Use Sample. These 35,086 families were divided into five groups depending on the husband's age (20-29, 30-39, 40-49, 50-59, and 60+), and then further subdivided depending on whether each family reported it was living in owned or rented housing.

<sup>15</sup>We refer to families as owning their home if the dwelling normally occupied by the family at the time of enumeration for the 1971 Census was owned by some member of the household.

<sup>16</sup>The dependent variable for renters is the monthly gross rent. The monthly gross rent is defined as the monthly cash rent actually paid plus all additional monthly expenditures required to maintain the dwelling, such as payments for water, electricity, gas and fuel. Gross rent was chosen in preference to cash rent as the measure of renters' costs since cash rents often include payments for a wide variety of services for which other tenants may be paying extra. The dependent variable in the monthly expenditure functions for owners is measured as an opportunity cost plus an operating cost. The opportunity cost component was included in this measure because owned housing is an investment alternative to other types of long-term securities, or to increased current consumption. This opportunity cost was computed by dividing by 12 the expected selling price reported by each owner for his home multiplied by the interest rate of 7.75% for the 1 November 1970 series of Canada Savings Bonds. The operating costs added for each family to this measure of opportunity cost are the 1971 average monthly amounts spent on shelter and household operation, minus expenditures on other houses, for homeowners without mortgages in all urbanized places in the given region (Atlantic, Quebec, Ontario, Prairie or British Columbia). See Ottawa: Statistics Canada, Family Expenditure in Canada, Vol. I, 1969, Tables 9, 22, 35, 48 and 61 for these regional averages.

The values we have used for gross rent are the mid-points of the categories <\$20, \$20-\$39, \$40-\$59, \$60-\$79, \$80-\$99, \$100-\$119, \$120-\$139, \$140-\$159, \$160-\$179, \$180-\$199, \$200-\$249, \$250-\$299, \$300-\$349, \$350-\$399, \$400-\$449, \$450-\$499, \$500-\$549 and \$550-\$599, with a value of \$700 assigned for all families where the actual gross rent was \$600 or more. The values we have used for the expected selling price are the mid-points of the categories <\$3,000, \$3,000-\$7,499, \$7,500-\$12,499, \$12,500-\$17,499, \$17,500-\$22,499, \$22,500-\$27,499, \$27,500-\$32,499, \$32,500-\$37,499, \$37,500-\$42,499, \$42,500-\$52,499, and \$52,500-\$62,499, with a value of \$70,000 assigned for all families where the expected selling price was \$62,500 or more.

In other studies it has been a common practice to relate the expected selling price of owned dwellings to some measure of the annual income of families. Ignoring the regional values for the costs of maintaining an owned dwelling which we have added to our opportunity costs measure of expenditures on owned housing, however, it can be shown that in a double log model only the constant term would be changed if the expected selling price itself and annual income were substituted for the monthly expenditure and income variables we have used.

<sup>17</sup>By size we mean the number of rooms. The actual number of rooms are given for dwellings with up to 11 rooms. The number of rooms in larger dwellings is always reported as 12.

<sup>18</sup>Further details of this work are available on request from Alice Nakamura.



## APPENDIX A

### RECLASSIFICATION OF 1951 AND 1961 INDUSTRIAL AND OCCUPATIONAL DATA

#### A.1. Introduction

Canadian women have been, and continue to be, occupationally and industrially segregated. As a result, their job opportunities are affected by the patterns of industrial and occupational growth in our society. In addition, other aspects of women's employment, such as their hours of work and income, are related to this occupational and industrial segregation. Thus, in order to fully understand the causes and effects of women's increasing participation in the labour force, research must include these occupational and industrial factors - both now and over time.

Such analyses, unfortunately, are hampered by changes in the industrial and, more importantly, the occupational classifications used in the 1951, 1961 and 1971 Censuses. Because we were convinced of the importance of historical patterns in a number of variables, we have reclassified the 1951 and 1961 data to the 1971 codes. This appendix describes this reclassification.

#### A.2. Industrial Reclassification

In actuality, we made only two changes in the industrial data presented in the published 1951 Census tables, and no changes in the published Census data for 1961. The changes made in the 1951 published data were to include the "Electricity, gas and water" category with the "Transportation, storage and communication" category, and to separate the "Government" category from the other "Service" groups.

Given that our data ignore the other classification changes that were made by Statistics Canada between 1951 and 1971, how accurate is it? Table A.1 compares the distributions for the total labour force and the female labour force calculated from our partially corrected data with these same distributions calculated from the industrial data that have been more fully corrected by Statistics Canada.<sup>1</sup> While there are discrepancies, they are small. The greatest discrepancies occur in the 1951 distributions for two reasons. First, the corrected data provided by

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See footnote(s) on page 152.

TABLE A.1. Comparison of the Distributions<sup>1</sup> of Total and Female Labour Forces, by Industry, 1951, 1961 and 1971, for Data Corrected by Statistics Canada and by Us

Industry	Distribution of total labour force						Distribution of female labour force					
	1951		1961		1971		1951		1961		1971	
	S.C. <sup>2</sup>	Ours <sup>3</sup>	S.C.	Ours	S.C.	Ours	S.C.	Ours	S.C.	Ours	S.C.	Ours
Agriculture	15.5	15.6	9.8	9.9	5.6	5.6	3.0	3.0	4.5	4.5	3.8	3.8
Forestry	2.5	2.5	1.7	1.7	0.9	0.9	0.2	0.2	0.1	0.1	0.1	0.1
Fishing and Trapping	1.0	1.0	0.6	0.6	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Mining	1.9	2.0	1.8	1.9	1.6	1.6	0.2	0.2	0.2	0.3	0.3	0.3
Manufacturing	24.5	25.7	21.6	21.7	19.8	19.8	22.9	23.6	17.0	17.1	13.7	13.7
Construction	6.1	6.6	6.8	6.7	6.2	6.2	0.5	0.5	0.6	0.6	0.9	0.9
Transportation	9.9	8.8	9.4	9.3	7.9	7.8	5.2	4.6	4.7	4.7	3.9	3.8
Trade	14.3	13.4	15.4	15.3	14.7	14.7	18.4	18.2	17.2	17.1	15.7	15.7
Finance	2.7	2.7	3.5	3.5	4.2	4.2	5.5	5.5	5.9	5.9	6.2	6.2
Community-Personal Service	15.0	14.6	19.6	19.5	23.7	23.7	38.9	38.4	42.5	42.4	39.7	39.7
Public Administration	5.3	5.8	7.4	7.5	7.3	7.4	4.1	4.6	4.9	4.9	5.5	5.5
Unspecified	1.3	1.3	2.4	2.5	7.9	7.9	1.1	1.1	2.4	2.4	10.2	10.2

<sup>1</sup>With the exception of our data for 1951, all figures include the Yukon and Northwest Territories.

<sup>2</sup>Corrected by Statistics Canada.

<sup>3</sup>Corrected by us.

Source: The data corrected by Statistics Canada are presented in the 1971 Census of Canada, Vol. III - Part 4, Table 1. Our corrected data were calculated from data presented in 1951 Census of Canada, Vol. IV, Table 16; 1961 Census of Canada, Vol. III - Part 2, Table 1A; and 1971 Census of Canada, Vol. III - Part 4, Table 2.

Statistics Canada include the Yukon and the Northwest Territories. The Yukon and the Northwest Territories have been excluded in general from the tables presented in the body of our monograph which have been calculated from our corrected data. In order to make the comparisons shown in Table A.1 we have added corrected figures for the Yukon and the Northwest Territories for 1961 and 1971. We were unable to do this, however, for 1951.<sup>2</sup> Second, our 1951 distributions are based on persons 14 years of age and over, while all other distributions are based on persons 15 years of age and over. It should also be noted that the discrepancies in the female distributions (our particular interest) are smaller than those in the distributions for the total labour force. This suggests that comparisons based on our corrected data for 1951, 1961 and 1971 may be relatively accurate, at least in terms of the general trends or patterns that are revealed. Since Statistics Canada has not published any corrected data on other variables such as hours worked per week or income cross-tabulated by industry, we believe that the available data over the period 1951-71 should be used to reflect industry-specific trends in these variables. One must recognize, however, that such data are not precisely accurate.

### A.3. Occupational Reclassification

Occupational data present a much greater problem. Census occupational data changed from 1951-61 and from 1961-71, primarily through a more precise specification of the broad "professional" and "blue-collar" occupations. As a result, comparisons over time are very difficult. At the same time, however, occupational data are more crucial than industrial data, since industrial changes in a society affect individuals at the occupational level. A full examination of changes in employment opportunities for women can come only through analyses of occupational patterns. It is for this reason that we reclassified the 1951 and 1961 Census occupational data into the 1971 categories (1971 being our major focus).

If it is difficult to carry out an "impossible" reclassification, it is even more difficult to assess its accuracy. However, we can (a) explain what we have done and (b) assess its adequacy for our purposes. This is done in the following sections.

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See footnote(s) on page 152.

#### A.3.1. The Reclassification Method

Our 1961 reclassification of occupational data was based on a less than exhaustive comparison of the Census Occupational Classification Manual for 1961 and for 1971. Our 1951 reclassification followed the general patterns developed in our 1961 reclassification.

Each occupational title in the 1951 and 1961 published Census Tables was assigned to a 1971 major group on the basis of the 1971 unit group that corresponds to the occupational title. As part of a detailed write-up of our reclassifications (available from Dallas Cullen) several minor areas are identified where our reclassification is in "error", in the sense that the assignment includes an occupational title that should not be so assigned. However two major problems should be noted here.

Because the definition of owners and managers has changed,<sup>3</sup> there are obvious inaccuracies in Major Group 11 (Managerial and administrative occupations), since we assigned all owners and managers to this group. Therefore data on this group (which has only a small percentage of women) must be interpreted with caution.

In general, 1951 and 1961 occupational titles were assigned to only one major group, unless the group clearly contained occupations that should be in more than one major group and/or the group was so large that assigning it to only one group would potentially distort the figures seriously (e.g. "other professionals" in both 1951 and 1961, and "Foremen - manufacturing and mechanical" in 1951). In all but one case, these multiple allocations were done equally, since there was no clear means to decide on a different allocation.

The exception was the labourers category. Nine 1971 major groups include labouring unit groups (61 - Service; 71 - Farming; 75 - Forestry, 77 - Mining; 81/82 - Processing; 85 - Product Fabricating; 87 - Construction; 93 - Materials Handling, and 99 - Occupations not elsewhere classified).<sup>4</sup> However, the labourers categories in the 1951 and 1961 data do not include those in farming, logging or mining, leaving only six groups to which this category should be assigned. Given its size, equal allocation is potentially distorting; allocation on the basis of 1971 figures imposes consistencies that may not be real, and the 1961 industrial breakdown of labourers is insufficient as a basis for differential allocation. We

See footnote(s) on page 152.

therefore made the somewhat arbitrary decision to allocate differentially on the basis of the number of labouring unit groups in each major group. Since there are a total of 21 labouring unit groups, this results in the following allocation of labourers: 1/21 to 61; 9/21 to 81/82; 6/21 to 85; 3/21 to 87; 1/21 to 93; and 1/21 (plus any remainder) to 99. The acceptability of this allocation will be discussed in the next Section.

#### A.3.2. Accuracy of the Occupational Reclassification

As mentioned earlier, it is extremely difficult to assess the accuracy of an impossible reclassification. We would like to deal with this problem in two ways. The first is to examine the trends revealed solely in our data, and in our data compared to other data. The second is to examine the effects of alternative classification rules.

Table A.2 presents our reclassified distributions for the total labour force and the female labour force, and for women as a percentage of the total labour force in each occupation for 1951, 1961 and 1971. As can be seen, the patterns are quite consistent in that there are few inexplicable major changes; the increase in women as a percentage of the farming group occurs because of the over-representation of unpaid family workers in the 1971 labour force; the increase in the not stated category is probably due to the fact that the 1971 Census was self-administered.

Consistency in our data can be taken as an indication of the acceptability of our reclassification only if other data sources that are believed to be more reliable indicate such consistency should occur. Table A.3 shows the distributions for the total and female labour forces, and for women as a percentage of the total labour force in each occupation for 1951 and 1961, as calculated from the 1961 Census, Occupation and Industry Trends. (Occupation and Industry Trends publication shows the 1951 occupational data rearranged on the basis of the 1961 classification system.) Thus trends can be compared over the period of 1951-61. These data corrected by Statistics Canada also reveal consistencies in the distributions, as well as patterns similar to those shown in Table A.2, such as increasing numbers in the professional occupations and decreasing numbers in the blue-collar occupations.

TABLE A.2. Reclassified Distributions of Total and Female Labour Forces and Females as a Percentage of Total Labour Force in Occupation, Canada,<sup>1</sup> 1951, 1961 and 1971

No.	Major group title	Distribution of total labour force			Distribution of female labour force			Females as percentage of total labour force in occupation		
		1951	1961	1971	1951	1961	1971	1951	1961	1971
11	Managerial	8.5	8.8	4.3	3.3	3.3	2.0	8.7	10.4	15.7
21	Natural Sciences, Engineering	1.3	2.1	2.7	0.4	0.4	0.6	6.9	4.8	7.3
23	Social Sciences	0.4	0.6	0.9	0.5	0.7	1.0	27.8	29.4	37.4
25	Religion	0.6	0.5	0.3	1.0	0.6	0.1	39.7	28.9	15.7
27	Teaching	2.2	3.1	4.1	6.7	7.3	7.1	67.2	64.4	60.4
31	Medicine and Health	2.1	3.2	3.8	6.5	8.6	8.2	68.5	72.1	74.3
33	Artistic	0.7	1.0	0.9	0.9	1.1	0.7	39.7	31.2	27.2
41	Clerical	11.8	13.7	15.9	30.1	30.6	31.8	56.1	61.0	68.4
51	Sales	5.8	7.2	9.5	8.8	8.4	8.4	33.3	32.0	30.4
61	Service	9.5	11.4	11.2	19.5	19.5	15.1	45.1	46.7	46.2
71	Farming	15.7	10.1	6.0	2.8	4.3	3.6	3.9	11.7	20.9
73	Fishing	1.0	0.5	0.3	0.0	0.0	0.0	0.4	0.8	1.6
75	Forestry	1.9	1.3	0.8	0.0	0.0	0.0	0.0	0.4	1.9
77	Mining	1.2	0.9	0.7	0.0	0.0	0.0	0.0	0.1	0.5
81/82	Processing	7.3	5.5	3.9	4.9	2.7	2.0	14.8	13.6	17.8
83	Machining	3.0	2.9	2.8	0.7	0.5	0.5	4.8	4.3	5.7
85	Fabricating	9.5	7.9	7.4	9.6	6.7	5.1	22.6	23.2	23.7
87	Construction	7.6	7.2	6.6	0.3	0.2	0.2	1.0	0.8	0.9
91	Transport	5.2	4.3	3.9	0.1	0.1	0.3	0.5	0.6	2.4
93	Materials Handling	1.4	2.4	2.4	1.7	1.7	1.4	27.2	19.3	19.7
95	Other crafts	1.6	1.4	1.3	0.6	0.5	0.5	8.4	9.1	12.4
99	Other	0.6	1.6	1.9	0.4	0.6	0.7	13.4	9.2	13.0
00	Not stated	1.2	2.6	8.5	1.1	2.4	10.8	20.6	26.0	43.4
	All occupations							22.0	27.3	34.3

<sup>1</sup>Data exclude the Yukon and Northwest Territories.

Source: Calculated from 1951 Census of Canada, Vol. IV, Table 4; 1961 Census of Canada, Vol. III - Part 1, Table 6; 1971 Census of Canada, Vol. III - Part 2, Table 2.

TABLE A.3. Statistics Canada Reclassified Distributions of Total Labour Force, Female Labour Force and Females as a Percentage of Total Labour Force in Occupation, Canada,<sup>1</sup> 1951 and 1961

Occupation	Percentage distribution of total labour force		Percentage distribution of female labour force		Female as percentage of total labour force	
	1951	1961	1951	1961	1951	1961
Managerial	8.0	8.3	3.3	3.3	9.1	10.7
Professional and Technical	7.3	9.7	14.3	15.4	43.3	43.3
Clerical	11.0	12.9	27.8	28.8	55.8	61.1
Sales	5.4	6.4	8.6	8.4	35.0	35.9
Service and Recreation	9.7	12.3	21.1	22.4	47.7	49.7
Transport and Communication	6.3	6.1	2.8	2.2	10.0	9.7
Farmers and Farm workers	15.7	10.0	2.8	4.3	3.9	11.7
Loggers and related workers	1.9	1.2	0.0	0.0	0.0	0.1
Fisherman, Trappers and Hunters	1.0	0.5	0.0	0.0	0.4	0.7
Miners, Quarrymen and related	1.2	1.0	0.0	0.0	0.0	0.0
Craftsmen, Production Process and related	24.7	23.6	16.3	11.7	14.5	13.4
Labourers	6.7	5.3	1.8	1.2	5.9	6.1
Not stated	1.2	2.6	1.1	2.4	20.5	26.0
All occupations	100.0	100.0	100.0	100.0	22.0	27.3

<sup>1</sup>These data exclude the Yukon and Northwest Territories.

Source: Calculated from 1961 Census of Canada, Bulletin SL-1, Labour Force Occupation and Industry Trends, Tables 8 and 8B.

This is shown more clearly in Table A.4, where occupational groups have been collapsed to obtain comparable broad groupings. As can be seen in this table, the distribution patterns are very similar. Furthermore, many of the differences can be demonstrated to be due to classification differences between the 1961 codes used in the published corrected data and the 1971 codes used by us.<sup>5</sup> For example, in both 1951 and 1961, our data show a somewhat higher percentage of the total female labour force in the clerical group than is true of the published corrected data, and a lower percentage in the blue-collar group. However, in our corrected data, telephone operators are in the clerical group, while in the data corrected by Statistics Canada they are in the blue-collar (transport and communication) group. Since female telephone operators were 2.5% of the female labour force in 1951, and 1.9% of the female labour force in 1961, their alternative placements almost totally accounts for the differences between the distributions. Similarly nursing assistants (1.6% of the female labour force in 1951 and 2.8% of the female labour force in 1961) are in the Professional and Technical group in our data, and in the Service group in the published corrected data. This latter difference may also partly explain the differences in female growth figures in these two occupational groups, since female nursing assistants grew 167.1% from 1951-61. In general, except for the other primary group, which contains an extremely small percentage and number of women, the growth patterns are similar.

Table A.4 also illustrates that inaccuracies in a reclassification are reduced or minimized when categories are combined. Obviously, one does not wish to combine categories to such an extent that the categories become meaningless. However, since our main report is based on analyses using the Individual and Family Files of the Public Use Sample, some of our categories will also be combined in historical analyses. Specifically, Major Groups 73, 75 and 77 are combined on both the Individual and Family Files, as are Major Groups 83 and 85, and 93, 95 and 99. In addition, Major Groups 21, 23, 25 and 33 are combined on the Family File.

Finally, it should be noted that even apparently major changes in reclassification can have relatively minor effects on data patterns or trends. This is shown in Table A.5, using the allocation of labourers as an illustration. As was mentioned in the description of the reclassification, in both 1951 and 1961 labourers were allocated in the following way: 1/21 to Major Group 61 (Service), 9/21 to Major Group 81/82 (Processing), 6/21 to Major Group 85 (Product Fabricating),

See footnote(s) on page 152.

TABLE A.4. Comparison of Distributions, Based on Data Corrected by Statistics Canada and by Us, for Combined Occupational Groups, Canada,<sup>1</sup> 1951 and 1961

Occupational group	Distribution of total labour force				Distribution of female labour force			
	1951		1961		1951		1961	
	S.C. <sup>2</sup>	Ours <sup>3</sup>	S.C.	Ours	S.C.	Ours	S.C.	Ours
Managerial (11) <sup>4</sup>	8.0	8.5	8.3	8.8	3.3	3.3	3.3	3.4
Professional and Technical (21,23,25,27,31,33)	7.3	7.2	9.7	10.5	14.3	16.1	15.4	18.5
Clerical (41)	11.0	11.8	12.9	13.7	27.8	30.1	28.8	30.6
Sales (51)	5.4	5.8	6.4	7.2	8.6	8.8	8.4	8.4
Service (61)	9.7	9.5	12.3	11.4	21.1	19.5	22.4	19.5
Farming (71)	15.7	15.7	10.0	10.1	2.8	2.8	4.3	4.3
Other Primary <sup>5</sup> (73,75,77)	4.1	4.0	2.7	2.8	0.0	0.0	0.0	0.0
Blue-Collar <sup>6</sup> (81/82,83 85,87,91,93,95,99)	37.6	36.2	35.0	33.0	20.9	18.2	15.0	12.9
Not Stated (00)	1.2	1.2	2.6	2.6	1.1	1.1	2.4	2.4
All occupations	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

	Percentage of females in occupation				Growth of total labour force		Growth of female labour force	
	1951		1961		1951-61		1951-61	
	S.C.	Ours	S.C.	Ours	S.C.	Ours	S.C.	Ours
Managerial (11)	9.1	8.7	10.7	10.4	28.1	26.8	50.4	52.0
Professional and Technical (21,23,25,27,31,33)	43.3	49.2	43.3	48.1	63.1	78.2	63.0	74.4
Clerical (41)	55.8	56.1	61.1	61.0	44.1	41.7	57.7	54.1
Sales (51)	35.0	33.3	35.9	32.0	43.0	50.5	46.8	44.6
Service (61)	47.7	45.1	49.7	46.7	54.4	45.9	60.9	51.2
Farming (71)	3.9	3.9	11.7	11.7	-21.4	-21.9	135.8	133.0
Other Primary <sup>5</sup> (73,75,77)	0.1	0.1	0.2	0.4	-18.2	-15.9	63.5	202.6
Blue-Collar <sup>6</sup> (81/82,83 85,87,91,93,95,99)	12.3	11.1	11.7	10.6	14.0	11.5	8.5	7.0
Not Stated (00)	20.5	20.5	26.0	26.0	158.8	158.0	228.2	226.8
All occupations	22.0	22.0	27.3	27.3	22.4	22.2	51.8	51.5

<sup>1</sup>These data exclude the Yukon and Northwest Territories.

<sup>2</sup>Corrected by Statistics Canada.

<sup>3</sup>Corrected by us.

<sup>4</sup>Numbers in parentheses indicate major groups that are included in the occupational group for data corrected by us.

<sup>5</sup>Data corrected by Statistics Canada include "Loggers and related workers", "Fishermen, Trappers and Hunters", "Miners, Quarrymen and related workers".

<sup>6</sup>Data corrected by Statistics Canada include "Transport and Communication occupations", "Craftsmen, Production Process and related workers", "Labourers".

Source: The data corrected by Statistics Canada are presented in the 1961 Census of Canada, Bulletin S1-1, Labour Force Occupation and Industry Trends, Tables 8 and 8B. Our corrected data were calculated from data presented in 1951 Census of Canada, Vol. IV, Table 4; and 1961 Census of Canada, Vol. III - Part 1, Table 6.

TABLE A.5. Comparison of Two Methods of Allocating 1951 and 1961 Labourers to 1971 Major Groups<sup>1</sup>

Major group <sup>2</sup>	Allocated percentage distribution of labourers		1971 percentage distribution of labourers		Total labour force in major group as percentage of total labour force			
	Total	Females	Total	Females	1951		1961	
					As allocated	Based on 1971 data	As allocated	Based on 1971 data
61	4.8	4.8	15.7	46.7	9.5	10.3	11.4	11.9
81/82	42.9	42.9	16.3	16.0	7.3	5.5	5.5	4.2
85	28.6	28.6	6.5	11.7	9.5	8.0	7.9	6.8
87	14.3	14.3	25.9	1.8	7.6	8.3	7.2	7.6
93	4.8	4.8	8.1	2.2	1.4	1.6	2.4	2.5
99	4.8	4.8	27.5	21.6	0.6	2.2	1.6	2.8

	Women as percentage of total labour force in major group				Female labour force in major group as percentage of total female labour force			
	1951		1961		1951		1961	
	As allocated	Based on 1971 data	As allocated	Based on 1971 data	As allocated	Based on 1971 data	As allocated	Based on 1971 data
61	19.5	20.3	19.5	20.0	45.1	43.5	46.7	45.7
81/82	4.9	4.4	2.7	2.4	14.8	17.6	13.6	15.7
85	9.6	9.2	6.7	6.5	22.6	25.2	23.2	26.0
87	0.3	0.1	0.2	0.1	1.0	0.3	0.8	0.2
93	1.7	1.6	1.7	1.6	27.2	22.7	19.3	17.8
99	0.4	0.7	0.6	0.8	13.4	7.1	9.2	7.5

<sup>1</sup>These data exclude the Yukon and Northwest Territories.

<sup>2</sup>See Section A.3.1 of text for definition of major groups.

Source: Calculated from 1951 Census of Canada, Vol. IV, Table 4; 1961 Census of Canada, Vol. III - Part 1, Table 6; 1971 Census of Canada, Vol. III - Part 2, Table 2.

3/21 to Major Group 87 (Construction), 1/21 to Major Group 93 (Materials Handling), and 1/21 (plus any remainder) to Major Group 99 (Occupations not elsewhere classified). This allocation is shown in percentage terms in Columns 1 (total labourers) and 2 (female labourers) of Table A.5. This can be contrasted with the 1971 distributions of all and female labourers (everyone in unit groups labelled "Occupations in labouring and other elemental work") shown in Columns 3 and 4. As can be seen, both total and female labourers in Major Groups 61 and 99 are under-estimated, as are the totals in Major Groups 87 and 93, while all others are over-estimated.

What are the actual discrepancies in the distributions of our interest? The remainder of this table compares data obtained using the described allocation of labourers with that obtained using an allocation based on the 1971 distributions of all and female labourers.

The distributions shown in Columns 5 through 12 are based on everyone included in the major group; that is, assigned labourers plus all others reclassified to that group. The distributions, particularly the female ones, are remarkably similar, given the differences shown in the first four columns of the table.

Columns 13 through 16 compare figures on women as a percentage of the total labour force in each group. Again, data from the two methods are quite similar.

This table illustrates two points about our reclassification. It is not, and cannot be, totally accurate. At the same time, however, it is apparently sufficiently accurate to reveal trends and general patterns in occupational data, both by itself and in relation to other variables, over the period 1951-71.

FOOTNOTES

<sup>1</sup> Statistics Canada notes that although the 1951 and 1961 data were adjusted on the basis of the 1970 Standard Industrial Classification, some adjustment of the 1970 groupings was necessary in order to obtain comparable data for all three census years.

<sup>2</sup> Industrial data for the Yukon and Northwest Territories are not available in the published tables for 1951. We were therefore not able to add in these 1951 data for comparison purposes in Table A.1.

<sup>3</sup> Unlike 1951 and 1961 groups, the 1971 "Managerial" group does not include department managers in stores, managers in retail chain stores or managers of super-market chain stores. In all three years, sales and advertising managers of chain stores are included in the "Managerial" group. Since there was no way to determine the number of such persons, no attempt was made to correct or reclassify these data. The effect is an over-estimation of the "Managerial" group in 1951 and 1961, and an under-estimation of the "Sales" group, which is the 1971 group to which store and department managers were assigned.

<sup>4</sup> In actuality, there are ten major groups with labouring unit groups. Since our historical tables combine Major Groups 93, 95 and 99, given the size of this labouring unit group in 1971, an arbitrary decision was made to exclude the printing occupations labouring group (Major Group 95).

<sup>5</sup> A general discussion of the differences between the 1961 and 1971 classifications is found in The Labour Force (August, 1973).

## APPENDIX B

### SPECIFICATION AND ESTIMATION OF OUR MODEL OF THE LABOUR FORCE BEHAVIOUR OF MARRIED WOMEN

#### B.1. Our Basic Model

Assume that a household maximizes a twice-differentiable quasi-concave utility function  $U(x, \ell_H, \ell_W; Z^*)$  subject to the time constraints

$$0 \leq h_H \leq T \quad (1)$$

$$0 \leq h_W \leq T \quad (2)$$

and a one-period budget constraint

$$px = A + w_H h_H + w_W h_W, \quad (3)$$

where  $x$  is a Hicksian composite good representing the consumption of all goods other than leisure at relative prices which are assumed to be the same for all households,  $\ell_H$  and  $\ell_W$  represent the non-market time (hours of leisure) of the husband and the wife respectively,  $h_H (= T - \ell_H)$  and  $h_W (= T - \ell_W)$  represent the market time (hours of work) of the husband and the wife at offered (market) wages  $w_H$  and  $w_W$  respectively,  $T$  is the total time available,  $p$  is the price of the Hicksian composite good, and  $A$  is asset income.  $Z^*$  is a vector of constraints which arise from previous economic choices or chance events such as the number of children and education of family members. For any given vector  $Z^*$ , the Lagrangean for this problem is

$$V = U(x, T - h_H, T - h_W; Z^*) + \gamma_1 h_H + \gamma_2 h_W + \lambda(A + w_H h_H + w_W h_W - px), \quad (4)$$

and the Kuhn-Tucker necessary and sufficient conditions for optimality are (1)-(3), and the existence of  $\lambda$ ,  $\gamma_1$  and  $\gamma_2$  such that

$$U_x - \lambda p = 0 \quad (5)$$

$$-U_H + \gamma_1 + \lambda w_H = 0 \quad (6)$$

$$-U_W + \gamma_2 + \lambda w_W = 0 \quad (7)$$

$$\gamma_1 h_H = 0 \quad (8)$$

$$\gamma_2 h_W = 0 \quad (9)$$

and

$$\gamma_1 \geq 0, \quad \gamma_2 \geq 0, \quad (10)$$

where  $U_x = \partial U / \partial x$ ,  $U_H = \partial U / \partial h_H$  and  $U_W = \partial U / \partial h_W$ .

Since the total time available is not likely to be used entirely for market activities, we have assumed that both  $h_H$  and  $h_W$  are less than  $T$ . The conditions (5)-(10) imply that

$$\lambda = U_x / p = (U_H - \gamma_1) / w_H = (U_W - \gamma_2) / w_W, \quad (11)$$

where  $\gamma_1$  and  $\gamma_2$  are both non-negative and vanish if  $h_H$  and  $h_W$ , respectively, become positive.

Assume for the moment that the leisure time of the husband and the leisure time of the wife are interchangeable with respect to the utility of the household, i.e.,  $U(x, \ell_H, \ell_W; Z^*) = U(x, \ell_W, \ell_H; Z^*)$  for any fixed  $x$ . Furthermore we assume that, for fixed  $x$ ,  $U_i(x, \ell_H, \ell_W; Z^*)$  is (i) strictly decreasing in  $\ell_i$  for fixed  $\ell_j$  ( $\partial U_i / \partial \ell_i < 0$  or  $\partial U_i / \partial h_i > 0$ ), and (ii) non-decreasing in  $\ell_j$  for fixed  $\ell_i$  ( $\partial U_i / \partial \ell_j \geq 0$  or  $\partial U_i / \partial h_j \leq 0$ ), where  $i, j = H$  or  $W$  and  $i \neq j$ . Assumptions (i) and (ii) refer to the law of diminishing returns in leisure and the benefits to a couple of shared leisure, respectively. These assumptions are satisfied if, for example,  $U(x, \ell_H, \ell_W; Z^*) = f(x) + b\sqrt{\ell_H} + c\sqrt{\ell_W} + d\sqrt{\ell_H \ell_W}$ , where  $f(x)$  is some function of  $x$ , and  $b$  and  $c$ , are fixed positive constants. Then, if  $w_H > w_W$ , we have  $(U_H / w_H) < (U_W / w_W)$  at  $h_H = h_W = 0$  for any fixed  $x$ . Since the marginal utility per dollar of the husband's leisure is less than that of his wife's, the husband will work for up to  $h_H^*$  ( $> 0$ ) hours.  $h_H^*$  is the point at which  $U_H(x, T - h_H, T; Z^*) / w_H$  becomes equal to  $U_W(x, T - h_H, T; Z^*) / w_W$ . Thus for any  $h_H^{**} > h_H^*$ ,  $U_H(x, T - h_H, T; Z^*) / w_H > U_W(x, T - h_H^{**}, T; Z^*) / w_W$ . If the income

constraint (3) is satisfied before  $h_H$  reaches  $h_H^*$ , the wife does not work, i.e.,  $h_W = 0$ . If, on the other hand, the income constraint is not yet met at  $h_H = h_H^*$ , then  $h_W$  starts to increase.

As  $h_W$  increases  $U_W$  also increases. Hence there may be a point, say  $h_W^* (> 0)$ , beyond which additional work by the husband becomes desirable. That is,  $U_H(x, T-h_H^*, T-h_W^*; Z^*)/w_H > U_W(x, T-h_H^*, T-h_W^*; Z^*)/w_W$  for any  $h_W$  satisfying  $h_W^* > h_W > 0$ , but  $U_H(x, T-h_H^*, T-h_W^*; Z^*)/w_H = U_W(x, T-h_H^*, T-h_W^*; Z^*)/w_W$  and  $U_H(x, T-h_H^*, T-h_W^*; Z^*)/w_H < U_W(x, T-h_H^*, T-h_W^*; Z^*)/w_W$  for any  $h_W$  satisfying  $T > h_H^* > h_W^* > 0$ . This process will continue until the budget constraint is satisfied, or until the hours of work of both the husband and the wife reach an institutional or physical upper bound. We will assume that the budget constraint is always satisfied.

Returning now to our assumption about the interchangeability of the leisure time of the husband and the wife, we note that little in our above analysis will change if  $U_H(x, \ell_H, \ell_W; Z^*) < U_W(x, \ell_H, \ell_W; Z^*)$  at  $h_H = h_W = 0$  so long as  $U_H$  and  $U_W$  satisfy Assumptions (i) and (ii). Our analysis above pertains to a world in which husbands and wives consider their leisure to be interchangeable, but due to discrimination or other reasons beyond the control of the individuals involved  $w_W < w_H$ . Relaxation of the assumption of interchangeability is appropriate if there are differences between men and women that lead many couples to assign a higher marginal utility to the leisure time of the wife at  $h_H = h_W = 0$ . This could in turn lead to the investment of less job-oriented human capital in the wife than in the husband, and hence to a situation where on the average  $w_W < w_H$ . The important points are that in either case the husband's decision to work will generally proceed the wife's decision to work (hence  $\gamma_1 = 0$  at optimality), and the husband will continue to increase his hours of work until the per dollar marginal utility of his leisure overtakes the per dollar marginal utility of his wife's leisure. Only at this point will the wife begin to work.

The observed values of  $w_H$  are in fact considerably higher than the observed values of  $w_W$ , as can be seen in Table 4.7. Moreover these observed differences are probably under-estimates of the true differences due to the existence of selection bias (see Gronau, 1974; Lewis, 1974).

## B.2. The Model Actually Estimated

The model described in Section B.1 implies a continual readjustment of  $h_H$ ,  $h_W$  and  $x$  until there exist non-negative  $\gamma_1$  and  $\gamma_2$  such that  $U_x/p = (U_H - \gamma_1)/w_H = (U_W - \gamma_2)/w_W$  where  $\gamma_1 = 0$  in general at optimality. In fact, however, the husband's hours of work may be substantially less flexible than either family consumption or the wife's hours of work. One common aspect of the lifetime career patterns chosen by most men is that their hours of work (as affected by vacations, overtime, and layoffs) are determined contractually according to custom in the employing organization, or through negotiations between the employing organization and the union representatives of the employees. Thus most men are probably not free to vary their hours of work at their primary job on a continual basis in response to the household utility maximization problem posed in Section B.1. Nor will a second job necessarily pay as well or offer as favourable working conditions as a man's primary job. Table B.1 offers some evidence for this line of argument. Despite fairly substantial differences in mean family size, mean asset income, mean hourly wage of the husband, and other variables between families where the wife does not work and those where the wife does work classified by the age of the wife, we find that the mean numbers of weeks worked per year and mean numbers of hours worked per week are quite similar in each age group for husbands both with and without working wives.

In attempting to describe the short-run (annual) labour force behaviour of the wife therefore, it may be more useful to view the husband's hours of work (and hence his earned income) as the outcome of long-run decisions made by the household and the husband himself. Thus it may be preferable for our purposes to view the household as maximizing a conditional utility function  $U(x, l_W; Z^*)$  subject to (2) and its income and time constraints,

$$px = A + I_H + w_W h_W \quad (12)$$

$$T = l_W + h_W, \quad (13)$$

where  $Z^*$ ,  $A$  and  $I_H = w_H h_H$  are assumed given.

Assuming as before that  $h_W$  is strictly less than  $T$ , the Lagrangean is now

TABLE B.1. Mean Weeks Worked Per Year, Hours Worked Per Week and Annual Employment Incomes of Husbands, Canada

Age of wife	Weeks worked per year			Hours worked per week			Total employment income		
	A <sup>1</sup>	NW <sup>2</sup>	W <sup>3</sup>	A <sup>1</sup>	NW <sup>2</sup>	W <sup>3</sup>	A <sup>1</sup>	NW <sup>2</sup>	W <sup>3</sup>
15-19	38.9	36.9	40.6	41.1	40.5	41.6	4418	4008	4766
20-24	43.1	42.3	43.5	41.7	41.9	41.5	5942	6068	5875
25-29	45.1	44.9	45.3	42.2	42.7	41.6	7520	7747	7278
30-34	45.7	45.6	45.8	42.4	42.4	42.4	8480	8871	7896
35-39	45.7	45.5	46.1	42.6	42.7	42.4	8685	8954	8254
40-44	45.2	44.6	45.8	42.0	41.8	42.3	8523	8692	8291
45-49	44.4	43.9	45.0	41.1	41.2	41.0	8253	8471	7962
50-54	42.0	41.5	42.7	39.3	39.1	39.6	7275	7357	7148
55-59	37.6	37.0	38.7	35.4	34.9	36.4	6163	6187	6115
60-64	29.6	27.9	35.3	28.1	26.6	33.1	4565	4344	5313
65 +	12.1	11.1	23.4	12.1	11.2	22.2	1539	1398	3108

<sup>1</sup>All households.

<sup>2</sup>Households in which the wife did not work in 1970.

<sup>3</sup>Households in which the wife worked in 1970.

Source: Calculated from 1971 Census of Canada, Public Use Sample Tape - Family File.

$$V = U(x, T-h_W; Z^*) + \gamma h_W + \lambda(A + I_H + w_W h_W - p_x),$$

and the Kuhn-Tucker conditions are (2), (12),

$$U_x - \lambda p = 0, \quad (14)$$

$$-U_W + \gamma + \lambda w_W = 0, \quad (15)$$

$$\gamma h_W = 0, \quad (16)$$

and

$$\gamma \geq 0. \quad (17)$$

Then rearranging (12) and (14) we get

$$x = (A + I_H + w_W h_W)/p \quad (18)$$

and

$$\lambda = U_x/p = [\partial U(x, T-h_W; Z^*)/\partial x]/p. \quad (19)$$

Given any offered wage  $w_W$ , it is seen from (18) and (19) that  $\lambda$  is a function of  $h_W$ ,  $p$ ,  $A + I_H$ ,  $w_W h_W$  and  $Z^*$  in equilibrium; that is:

$$\lambda = \lambda(h_W, p, A + I_H, w_W h_W; Z^*). \quad (20)$$

Since by (15) we have that in equilibrium

$$\lambda = (U_W - \gamma)/w_W,$$

or

$$w_W = (U_W/\lambda) - (\gamma/\lambda), \quad (21)$$

we can rewrite (21) as

$$w_W = w_W^* - (\gamma/\lambda),$$

where

$$w_W^* = U_W/\lambda \quad (22)$$

is the shadow price of a wife's time (asking wage) which depends on  $h_W$ ,  $p$ ,  $A + I_H$ ,  $w_W h_W$ , and  $Z^*$  when  $h_W > 0$ , and on  $p$ ,  $A + I_H$  and  $Z^*$  when  $h_W = 0$ . Since  $\lambda > 0$  by (19) and since (16) implies  $\gamma = 0$  if  $h_W > 0$  and  $\gamma \geq 0$  if  $h_W = 0$ , we have  $w_W = w_W^*$  if  $h_W > 0$  and  $w_W \leq w_W^*$  if  $h_W = 0$ .

One crucial aspect of this solution is that the wife's asking wage  $w_W^*$  is found to depend on her income  $w_W h_W$ , which in turn depends on her offered wage  $w_W$ . With the types of consumer goods often considered in demand studies, it makes sense to consider the rate at which a household is willing to trade units of one of these goods for more units of some other good. However, the "good" leisure cannot be treated in this manner. Rather the mechanism by which leisure is generally traded for the increased consumption of other goods, including the leisure of the other spouse, is through the relaxation of the household budget constraint. Thus the term  $w_W h_W$  must be included in this constraint.

If we take the log of the both sides of (22) and linearize it around  $Z_i^*$ ,  $A_i$ ,  $(I_H)_i$ ,  $\ln w_i (= \ln(w_W)_i)$  and  $(h_W)_i$ , then we get the linear approximation of the log of the asking wage associated with the  $i^{\text{th}}$  married woman:

$$\ln w_i^* = \begin{cases} \beta_0 + Z_i^* \beta_1 + \beta_2 A_i + \beta_3 (I_H)_i + \beta_4 \ln w_i + \beta_5 (h_W)_i + \mu_i^* & \text{if } (h_W)_i > 0 \\ \beta_0 + Z_i^* \beta_1 + \beta_2 A_i + \beta_3 (I_H)_i + \mu_i^* & \text{if } (h_W)_i = 0. \end{cases} \quad (23)$$

where on the basis of our previous argument  $\beta_2$  and  $\beta_3$  are expected to be equal. The variable  $p$  does not appear in the asking wage equation because it is assumed to be the same for all households. Although the wife's offered wage,  $w_W$ , is also essentially a price variable, it cannot be ignored in this way since it differs systematically from one wife to another. We will assume that

$$\ln w_1 = \alpha_0 + Z_1 \alpha_1 + E_1 \alpha_2 + \nu_1, \quad (24)$$

where  $Z$  and  $E$  are vectors of personal and regional economic variables that are believed to determine the log of a married woman's offered wage. In general,  $Z_1^*$  and  $Z_1$  are thought to have certain components in common that affect both the offered and asking wages.

Equation (23) is over-identified. Thus we are not able to obtain unique estimates of the shadow price of the wife's time for given values of  $h_w$ ,  $A$  +  $I_H$  and  $Z^*$ . However, we are able to estimate a reduced form expression for the wife's equilibrium number of hours of work. Our expectation is that the  $i^{\text{th}}$  married woman decides to work if and only if

$$(w_1 - w_1^*) \Big|_{(h_w)_1 = 0} > 0, \quad (25)$$

or equivalently  $(\ln w_1 - \ln w_1^*) \Big|_{(h_w)_1 = 0} > 0$ , and that for those women who do work

an equilibrium number of hours of work, say  $h_1$ , exists and is derived by equating  $w_1$  and  $w_1^*$ , or equivalently  $\ln w_1$  and  $\ln w_1^*$ . Thus for the  $i^{\text{th}}$  married woman

$$\ln w_1 = \ln w_1^* \quad \text{at} \quad h_1 > 0, \quad (26)$$

or

$$h_1 = \frac{1}{\beta_5} [(1-\beta_4) \ln w_1 - \beta_0 - Z_1^* \beta_1 - \beta_2 A_1 - \beta_3 (I_H)_1 - \nu_1^*]. \quad (27)$$

### B.3. Estimation of the Model

The structural equations to be estimated are the offered wage Equation (24) and the hours equation

$$h_1 = \frac{1}{\beta_5} [(1-\beta_4) \ln w_1 - \beta_0 - Z_1^* \beta_1 - \beta_2 A_1 - \beta_3 (I_H)_1] + \nu_1^* \quad (27')$$

where  $\nu_1^* = -(\frac{1}{\beta_5}) \nu_1$ . We assume the covariance structure

$$E(v_1) = E(v_1^*) = 0, \quad (28)$$

$$E(\mu_i, \mu_j) = \begin{cases} \sigma_1^2 & \text{if } i = j \\ 0 & \text{if } i \neq j \end{cases}, \quad (29)$$

$$E(v_i^*, v_j^*) = \begin{cases} \sigma_2^2 & \text{if } i = j \\ 0 & \text{otherwise} \end{cases}, \quad (30)$$

and

$$E(\mu_j, v_j^*) = \begin{cases} \sigma_{12} & \text{if } i = j \\ 0 & \text{otherwise} \end{cases}. \quad (31)$$

We observe positive values for  $w_i$  only for those who worked for pay or profit in 1970 (i.e.,  $h_i > 0$ ). Hence a selection bias exists in our data (see Gronau, 1974; Lewis, 1974), and we need to include a bias correction term in (24) and (27') as suggested by Heckman (1976). Assuming a joint normal distribution of  $\mu_i$  and  $v_i^*$ , it is shown (see, for example, Johnson and Kotz, 1972, pp. 112-113) that the selection biases for (24) and (27') are represented by

$$E(\mu_i | h_i > 0) = (\sigma_{12}/\sigma_2) \lambda_i \quad (32)$$

$$E(v_i^* | h_i > 0) = \sigma_2 \lambda_i \quad (33)$$

where

$$\lambda_i = f(\phi_i)/F(\phi_i), \quad (34)$$

and  $f(\phi)$  and  $F(\phi)$  are, respectively, the density and cumulative density functions of the standard normal distribution. The  $\phi_i$  in (34), and hence  $\lambda_i$  for each married woman, are derived by probit analysis as follows. Substituting the right-hand side of Equation (24) for the log of the wife's offered wage in Equation (27') we get the expression

$$h_i = \gamma_0 + \gamma_1 \gamma_{11} + \gamma_2^* \gamma_{12} + \gamma_3 A_i + \gamma_4 (I_H)_i + E_i \gamma_5 + r_i^*$$

where  $r_i^*$  is a normal random variable with variance  $\sigma^2$ . Defining  $D_i$  to be one or zero depending on whether or not the  $i^{\text{th}}$  married woman works, we have

$$\begin{aligned} P(D_i = 1) &= -P(h_i > 0) = P(r_i^* > -(\gamma_0 + \gamma_1 \gamma_{11} + \gamma_2^* \gamma_{12} + \gamma_3 A_i + \gamma_4 (I_H)_i + E_i \gamma_5)) \\ &= \frac{1}{\sqrt{2\pi}} \int_{\phi_i}^{\infty} e^{-(t^2/2)} dt \end{aligned} \quad (35)$$

where

$$\phi_i = -((\gamma_0/\sigma) + \gamma_1(\gamma_{11}/\sigma) + \gamma_2^*(\gamma_{12}/\sigma) + (\gamma_3/\sigma)A_i + (\gamma_4/\sigma)(I_H)_i + E_i(\gamma_5/\sigma)) \quad (36)$$

Maximum likelihood estimation gives probit estimates for the coefficients  $(\gamma_0/\sigma)$ ,  $(\gamma_1/\sigma)$ ,  $(\gamma_2/\sigma)$ ,  $(\gamma_3/\sigma)$ ,  $(\gamma_4/\sigma)$ , and  $(\gamma_5/\sigma)$ , which in turn can be used to calculate  $\phi_i$  by (36) and  $\lambda_i$  by (34) for the  $i^{\text{th}}$  married woman.

After estimating the probit coefficients from the entire sample of married women, we estimated the following regression Equations (37) and (38) for  $\ln w_i$  and  $h_i$  using the subsample of all married women who actually worked and for whom  $\phi_i$  and  $\lambda_i$  were computed by (36) and (34). From (24), (27'), (32) and (33) we have

$$E(\ln w_i | Z_i, E_i, h_i > 0) = \alpha_0 + Z_i \alpha_1 + E_i \alpha_2 + (\sigma_{12}/\sigma_2) \lambda_i$$

and

$$\begin{aligned} E(h_i | \ln w_i, Z_i, A_i, (I_H)_i, h_i > 0) \\ = \frac{1}{\beta_5} [(1 - \beta_4) \ln w_i - \beta_0 - Z_i \beta_1 - \beta_2 A_i - \beta_3 (I_H)_i] + \sigma_2 \lambda_i, \end{aligned}$$

or in regression form

$$\ln w_i = \alpha_0 + Z_i \alpha_1 + E_i \alpha_2 + (\sigma_{12}/\sigma_2) \lambda_i + v_i \quad (37)$$

and

$$h_i = \frac{1}{\beta_5} [(1 - \beta_4) \ln w_i - \beta_0 - Z_i \beta_1 - \beta_2 A_i - \beta_3 (I_H)_i] + \sigma_2 \lambda_i + v_i^* \quad (38)$$

where the covariance structure of  $V_i$  and  $V_i^*$  is shown to be (see Heckman, 1976)

$$E(V_i^*) = \sigma_2^2 M_i \quad (39)$$

$$E(V_i V_i^*) = \sigma_{12} M_i \quad (40)$$

$$E(V_i^2) = \sigma_1^2(1-\rho^2) + \sigma_1^2 \rho^2 M_i \quad (41)$$

where

$$M_i = 1 + \phi_1 \lambda_1 - \lambda_1^2 \quad (42)$$

and

$$\rho = \sigma_{12}/\sigma_1 \sigma_2 \quad (43)$$

Since the disturbance terms  $V_i$  and  $V_i^*$  have heteroskedastic variances over a cross-section of married women and since  $\ln w_i$  appears in (38), we used the following combination of two-stage least squares and generalized least squares (GLS) to estimate (37) and (38) as follows:

1. Use ordinary least squares (OLS) to estimate the coefficients of (37). Then the variance of  $V_i$  is estimated as  $a+bM_i$  using (41) where  $a$  and  $b$  are the estimated intercept and slope when the squares of the OLS residuals from (37) are regressed on  $M_i$ , which is calculated for each married woman who worked from (42). The GLS estimates are then found by applying weighted OLS to (37) using the estimated variances of the disturbance term, and predicted values are calculated for  $\ln w_i$ .
2. The predicted values calculated for  $\ln w_i$  in (i) are substituted for the actual values of  $\ln w_i$  in (38), and OLS estimates are obtained for this relationship. Then the variance of  $V_i^*$  is estimated as  $s_2^2 M_i$  where  $s_2^2$  is the OLS estimate of the coefficient of  $\lambda_1$  in (38) obtained from the first iteration, and GLS estimates are found for (38) by using weighted OLS with these estimated variances. In deriving GLS estimates for (37) and (38) the inter-equation correlation given by (40) was ignored.

Thus for each age group in our data base the probit coefficients  $(\gamma_0/\sigma)$ ,  $(\gamma_1/\sigma)$ ,  $(\gamma_2/\sigma)$ ,  $(\gamma_3/\sigma)$ ,  $(\gamma_4/\sigma)$  and  $(\gamma_5/\sigma)$  were estimated. Then for those wives who worked  $\phi_i$ ,  $\lambda_i$  and  $M_i$  were computed using (34), (36) and (42), and GLS estimates were obtained for the offered wage and hours of work Equations, (37) and (38), by the procedure described above. Estimation results for the probit coefficients and for the offered wage and hours of work equation are presented in Chapters 1 and 3.

# SELECTED BIBLIOGRAPHY

- Allingham, J.D., and Spencer, B.G. 1968. Women Who Work: Part 2, The Influence of Age, Education, Child-bearing Status, and Residence, Dominion Bureau of Statistics, Special Labour Force Studies, Series B. Ottawa: Queen's Printer.
- Ben-Porath, Y. 1974. Economic Analysis of Fertility in Israel, in Economics of the Family, ed. T.W. Schultz. Chicago: University of Chicago Press.
- Bergmann, B.R., and Adelman, I. 1973. The Economic Role of Women, American Economic Review, (September): pp. 509-514.
- Bowen, W.G., and Finegan, F.A. 1969. The Economics of Labor Force Participation. Princeton: Princeton University Press.
- Canada, Bank of Canada. 1971. The Bank of Canada Review, p.597. Ottawa: Bank of Canada.
- Canada, Department of National Revenue. 1972. 1972 Taxation Statistics Analyzing 1970 T1 Individual Tax Returns and Miscellaneous Statistics. Ottawa.
- Canada. Dominion Bureau of Statistics. 1953. Ninth Census of Canada. 1951, Vol. II, Population, Cross-classifications of Characteristics. Ottawa: Queen's Printer.
- Canada. Dominion Bureau of Statistics. 1953. Ninth Census of Canada 1951, Vol. III, Housing and Families. Ottawa: Queen's Printer.
- Canada. Dominion Bureau of Statistics. 1953. Ninth Census of Canada 1951, Vol. IV, Labour Force, Occupations and Industries. Ottawa: Queen's Printer.
- Canada. Dominion Bureau of Statistics. 1953. Ninth Census of Canada 1951, Vol. V, Labour Force, Earnings and Employment of Wage-earners. Ottawa: Queen's Printer.
- Canada. Dominion Bureau of Statistics. 1964. 1961 Census of Canada, Vol. I - Part 3, Population, Cross Classifications of Characteristics. Ottawa: Queen's Printer.
- Canada. Dominion Bureau of Statistics. 1965. 1961 Census of Canada, Vol. III - Part 1, Labour Force Occupations. Ottawa: Queen's Printer.
- Canada. Dominion Bureau of Statistics. 1965. 1961 Census of Canada, Vol. III - Part 2, Labour force, Industries. Ottawa: Queen's Printer.
- Canada. Dominion Bureau of Statistics. 1965. 1961 Census of Canada, Vol. III - Part 3, Wage-earners, Earnings and Employment. Ottawa: Queen's Printer.
- Canada. Dominion Bureau of Statistics. 1966. 1961 Census of Canada, Labour Force, Occupation and Industry Trends, Bulletin SL-1, Catalogue 94-551. Ottawa: Queen's Printer.

- Canada. Statistics Canada. Occupational Classification Manual. Census of Canada 1951 and 1971, Catalogue 12-536. Ottawa.
- Canada. Statistics Canada. The Labour Force, 1951-71, Vols. 1-27. Ottawa.
- Canada. Statistics Canada. 1973. Family Expenditure in Canada, Vol. I, All Canada: Urban and Rural, 1969, Catalogue 62-535. Ottawa: Information Canada.
- Canada. Statistics Canada. 1974. 1971 Census of Canada, Population. Bulletin 1.5-3, Catalogue 92-743. Ottawa: Information Canada.
- Canada. Statistics Canada. 1974. 1971 Census of Canada, Labour force and individual income. Bulletin 3.1-2, Catalogue 94-702. Ottawa: Information Canada.
- Canada. Statistics Canada. 1974. 1971 Census of Canada, Labour Force: Industries. Bulletin 3.4-3, Catalogue 94-740. Ottawa: Information Canada.
- Canada. Statistics Canada. 1975. 1971 Census of Canada, Labour force and individual income. Bulletin 3.1-13, Catalogue 94-713. Ottawa: Information Canada.
- Canada. Statistics Canada. 1975. 1971 Census of Canada, Occupations. Bulletin 3.2-9, Catalogue 94-723. Ottawa: Information Canada.
- Canada. Statistics Canada. 1975. 1971 Census of Canada, Industries. Bulletin 3.5-2, Catalogue 94-749. Ottawa: Information Canada.
- Canada. Statistics Canada. 1975. 1971 Census of Canada, Labour force activity - Work experience. Bulletin 3.7-2, Catalogue 94-772. Ottawa: Information Canada.
- Canada. Statistics Canada. 1975. 1971 Census of Canada, Labour force activity - Work experience. Bulletin 3.7-7, Catalogue 94-777. Ottawa: Information Canada.
- Canada. Statistics Canada. 1975. 1971 Census of Canada, Labour force activity - Work experience. Bulletin 3.7-10, Catalogue 94-780. Ottawa: Information Canada.
- Canada. Statistics Canada. 1975. 1971 Census of Canada, Labour force activity - Work experience. Bulletin 3.7-11, Catalogue 94-781. Ottawa: Information Canada.
- Canada. Statistics Canada. 1975. 1971 Census of Canada, Labour force activity - Work experience. Bulletin 3.7-13, Catalogue 94-783. Ottawa: Information Canada.
- Canada. Statistics Canada. 1976. 1971 Census of Canada, Occupations. Bulletin 3.2-1, Catalogue 94-715. Ottawa: Statistics Canada.
- Canada. Statistics Canada. 1976. 1971 Census of Canada, Industries. Bulletin 3.4-2, Catalogue 94-739. Ottawa: Information Canada.

- Carliner, G. 1973. Income Elasticity of Housing Demand. Review of Economics and Statistics: pp. 528-532.
- Davis, N.H.W. 1969. Some Methods of Analysing Cross-classified Census Data - The Case of Labour Force Participation Rates. Special Labour Force Studies, Series B, No. 3, Catalogue 71-515, Occasional. Ottawa: Queen's Printer.
- de Leeuw, F. 1971. The Demand for Housing: A Review of Cross-Section Evidence. Review of Economics and Statistics, (February): pp. 1-10.
- Ferris, A.L. 1971. Indicators of Trends in the Status of American Women. New York.
- Finnegan, T.A. 1962. Hours of Work in the United States: A Cross-Sectional Analysis. Journal of Political Economy, (October): pp. 452-470.
- Fuchs, V.R. 1974. Recent Trends and Long-Run Prospects for Female Earnings. American Economic Review, (May): pp. 236-242.
- Gilmour, A.N. 1968. Provincial Income Tax Handbook. Toronto: Richard De Boo Ltd.
- Gross, E. 1968. Plus ça Change ...? The Sexual Structure of Occupations Over Time. Social Problems, (Fall): pp. 198-208.
- Gronau, R. 1974. Wage Comparisons - A Selectivity Bias, Journal of Political Economy, (November/December): pp. 1119-1143.
- Gunderson, M. 1976. Work Patterns. In Opportunity for Choice: A Goal for Women in Canada, ed. G.C.A. Cook. Ottawa: pp. 93-142.
- Gunderson, M. 1977. Logit Estimates of Labour Force Participation Based on Census Cross-Tabulations. The Canadian Journal of Economics, (August): pp. 453-462.
- Heckman, J.J. 1976. The Common Structure of Statistical Models of Truncation, Sample Selection and Limited Dependent Variables and a Simple Estimator for Such Models. Annals of Economic and Social Measurement, (Fall): pp. 475-492.
- Henripin, Jacques. 1972. Trends and Factors of Fertility in Canada. Ottawa: Statistics Canada.
- Johnson, N., and Kotz, S. 1972. Distributions in Statistics: Continuous Multivariate Distributions. New York.
- Kain, J.T., and Quigley, J.M. 1972. Housing Market Discrimination, Home-ownership, and Savings Behavior. American Economic Review: pp. 263-277.
- Kendall, M.G., and Stuart, A. 1958. The Advanced Theory of Statistics, Vol. 1. London: Charles Griffin.
- Kniesner, T.J. 1976. An Indirect Test of Complementarity in a Family Labor Supply Model. Econometrica: pp. 651-669.
- Lee, T.H. 1968. Housing and Permanent Income: Tests Based on a Three-Year Reinterview Survey. Review of Economics and Statistics: pp. 480-490.

- Lewis, H.G. 1974. Comments on Selectivity Biases in Wage Comparisons. Journal of Political Economy, (November/December): pp. 1145-1155.
- McIlveen, N. and Sims, H. 1978. The Flow Components of Unemployment in Canada. Special Labour Force Studies, Series A, No. 11. Ottawa: Statistics Canada.
- Meltz, N.M. 1965. Changes in the Occupational Composition of the Canadian Labour Force 1931-1961. Ottawa: Queen's Printer.
- Oksanen, E. 1966. Housing Demand in Canada, 1947-62: Some Preliminary Experimentation. Canadian Journal of Economics and Political Science, August.
- Oppenheimer, V.K. 1970. The Female Labour Force in the United States, Demographic and Economic Factors Governing its Growth and Changing Composition. Berkeley.
- Ostry, S. 1967. The Occupational Composition of the Canadian Labor Force. Ottawa: Queen's Printer.
- Ostry, S. 1968. The Female Worker in Canada. 1961 Census Monograph. Ottawa: Queen's Printer.
- Owen, J.D. 1971. The Demand for Leisure. Journal of Political Economy, Vol. 79: pp. 56-76.
- Pindyck, R.S. and Rubinfeld, D. 1976. Econometric Models and Economic Forecasts. New York: McGraw-Hill.
- Ramanathan, R. 1971. Measuring the Permanent Income of a Household: An Experiment in Methodology. Journal of Political Economy, (January): pp. 177-185.
- Skoulas, N. 1974. Determinants of the Participation Rates of Married Women in the Canadian Labour Force: An Econometric Analysis. Ottawa: Information Canada.
- Smith, L.B. 1971. Housing in Canada: Market Structure and Policy Performance. Ottawa: Central Mortgage and Housing Corporation.
- Smith, L.B. 1974. The Postwar Canadian Housing and Residential Mortgage Market and the Role of Government. Toronto: University of Toronto Press.
- Spencer, B.G., and Featherston, D.C. 1970. Why Married Women are in the Labour Force: A Microeconomic Study. Canadian Statistical Review, (April): pp. 4-5 and 104-105.
- Willis, R.J. 1974. Economic Theory of Fertility Behavior. In Economics of the Family, ed. T.W. Schultz. Chicago: University of Chicago Press.
- Wonnacott, T.H., and Wonnacott, R.J. 1972. Introductory Statistics for Business and Economics. Toronto: Wiley.

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